National Library of Canada
Acquisitions and Bibliographic Services Branch
395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale du Canada
Direction des acquisitions et des services bibliographiques
395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

Canada

UNIVERSITY OF ALBERTA

PSYCHOLOGICAL DIMENSIONS IN REHABILITATIVE TREATMENT OF CRANIOFACIAL DEFORMITIES

BY

© STEPHAN STEPHANSON

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
AND RESEARCH IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF EDUCATION
IN
COUNSELLING PSYCHOLOGY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA
FALL 1994

National Library of Canada
Acquisitions and Bibliographic Services Branch
395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale du Canada
Direction des acquisitions et des services bibliographiques
395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-94971-6

Canada

Name STEPHANIE STEPHANSON

Dissertation Abstracts International is arranged by broad, general subject categories. Please select the one subject which most nearly describes the content of your dissertation. Enter the corresponding four-digit code in the spaces provided.

SUBJECT TERM

SUBJECT CODE 0525

U·M·I

Subject Categories

THE HUMANITIES AND SOCIAL SCIENCES

COMMUNICATIONS AND THE ARTS
- Architecture 0729
- Art History 0377
- Cinema 0900
- Dance 0378
- Fine Arts 0357
- Information Science 0723
- Journalism 0391
- Library Science 0399
- Mass Communications 0708
- Music 0413
- Speech Communication 0459
- Theater 0465

EDUCATION
- General 0515
- Administration 0514
- Adult and Continuing 0516
- Agricultural 0517
- Art 0273
- Bilingual and Multicultural 0282
- Business 0688
- Community College 0275
- Curriculum and Instruction 0727
- Early Childhood 0518
- Elementary 0524
- Finance 0277
- Guidance and Counseling 0519
- Health 0680
- Higher 0745
- History of 0520
- Home Economics 0278
- Industrial 0521
- Language and Literature 0279
- Mathematics 0280
- Music 0522
- Philosophy of 0998
- Physical 0523
- Psychology 0525
- Reading 0535
- Religious 0527
- Sciences 0714
- Secondary 0533
- Social Sciences 0534
- Sociology of 0340
- Special 0529
- Teacher Training 0530
- Technology 0710
- Tests and Measurements 0288
- Vocational 0747

LANGUAGE, LITERATURE AND LINGUISTICS
- Language
  - General 0679
  - Ancient 0289
  - Linguistics 0290
  - Modern 0291
- Literature
  - General 0401
  - Classical 0294
  - Comparative 0295
  - Medieval 0297
  - Modern 0298
  - African 0316
  - American 0591
  - Asian 0305
  - Canadian (English) 0352
  - Canadian (French) 0355
  - English 0593
  - Germanic 0311
  - Latin American 0312
  - Middle Eastern 0315
  - Romance 0313
  - Slavic and East European 0314

PHILOSOPHY, RELIGION AND THEOLOGY
- Philosophy 0422
- Religion
  - General 0318
  - Biblical Studies 0321
  - Clergy 0319
  - History of 0320
  - Philosophy of 0322
- Theology 0469

SOCIAL SCIENCES
- American Studies 0323
- Anthropology
  - Archaeology 0324
  - Cultural 0326
  - Physical 0327
- Business Administration
  - General 0310
  - Accounting 0272
  - Banking 0770
  - Management 0454
  - Marketing 0338
- Canadian Studies 0385
- Economics
  - General 0501
  - Agricultural 0503
  - Commerce-Business 0505
  - Finance 0508
  - History 0509
  - Labor 0510
  - Theory 0511
- Folklore 0358
- Geography 0366
- Gerontology 0351
- History
  - General 0578
  - Ancient 0579
  - Medieval 0581
  - Modern 0582
  - Black 0328
  - African 0331
  - Asia, Australia and Oceania 0332
  - Canadian 0334
  - European 0335
  - Latin American 0336
  - Middle Eastern 0333
  - United States 0337
- History of Science 0585
- Law 0398
- Political Science
  - General 0615
  - International Law and Relations 0616
  - Public Administration 0617
- Recreation 0814
- Social Work 0452
- Sociology
  - General 0626
  - Criminology and Penology 0627
  - Demography 0938
  - Ethnic and Racial Studies 0631
  - Individual and Family Studies 0628
  - Industrial and Labor Relations 0629
  - Public and Social Welfare 0630
  - Social Structure and Development 0700
  - Theory and Methods 0344
- Transportation 0709
- Urban and Regional Planning 0999
- Women's Studies 0453

THE SCIENCES AND ENGINEERING

BIOLOGICAL SCIENCES
- Agriculture
  - General 0473
  - Agronomy 0285
  - Animal Culture and Nutrition 0475
  - Animal Pathology 0476
  - Food Science and Technology 0359
  - Forestry and Wildlife 0478
  - Plant Culture 0479
  - Plant Pathology 0480
  - Plant Physiology 0817
  - Range Management 0777
  - Wood Technology 0746
- Biology
  - General 0306
  - Anatomy 0287
  - Biostatistics 0308
  - Botany 0309
  - Cell 0379
  - Ecology 0329
  - Entomology 0353
  - Genetics 0369
  - Limnology 0793
  - Microbiology 0410
  - Molecular 0307
  - Neuroscience 0317
  - Oceanography 0416
  - Physiology 0433
  - Radiation 0821
  - Veterinary Science 0778
  - Zoology 0472
- Biophysics
  - General 0786
  - Medical 0760

EARTH SCIENCES
- Biogeochemistry 0425
- Geochemistry 0996
- Geodesy 0370
- Geology 0372
- Geophysics 0373
- Hydrology 0388
- Mineralogy 0411
- Paleobotany 0345
- Paleoecology 0426
- Paleontology 0418
- Paleozoology 0985
- Palynology 0427
- Physical Geography 0368
- Physical Oceanography 0415

HEALTH AND ENVIRONMENTAL SCIENCES
- Environmental Sciences 0768
- Health Sciences
  - General 0566
  - Audiology 0300
  - Chemotherapy 0992
  - Dentistry 0567
  - Education 0350
  - Hospital Management 0769
  - Human Development 0758
  - Immunology 0982
  - Medicine and Surgery 0564
  - Mental Health 0347
  - Nursing 0569
  - Nutrition 0570
  - Obstetrics and Gynecology 0380
  - Occupational Health and Therapy 0354
  - Ophthalmology 0381
  - Pathology 0571
  - Pharmacology 0419
  - Pharmacy 0572
  - Physical Therapy 0382
  - Public Health 0573
  - Radiology 0574
  - Recreation 0575
  - Speech Pathology 0460
  - Toxicology 0383
- Home Economics 0386

PHYSICAL SCIENCES

Pure Sciences
- Chemistry
  - General 0485
  - Agricultural 0749
  - Analytical 0486
  - Biochemistry 0487
  - Inorganic 0488
  - Nuclear 0738
  - Organic 0490
  - Pharmaceutical 0491
  - Physical 0494
  - Polymer 0495
  - Radiation 0754
- Mathematics 0405
- Physics
  - General 0605
  - Acoustics 0986
  - Astronomy and Astrophysics 0606
  - Atmospheric Science 0608
  - Atomic 0748
  - Electronics and Electricity 0607
  - Elementary Particles and High Energy 0798
  - Fluid and Plasma 0759
  - Molecular 0609
  - Nuclear 0610
  - Optics 0752
  - Radiation 0756
  - Solid State 0611
- Statistics 0463

Applied Sciences
- Applied Mechanics 0346
- Computer Science 0984
- Engineering
  - General 0537
  - Aerospace 0538
  - Agricultural 0539
  - Automotive 0540
  - Biomedical 0541
  - Chemical 0542
  - Civil 0543
  - Electronics and Electrical 0544
  - Heat and Thermodynamics 0348
  - Hydraulic 0545
  - Industrial 0546
  - Marine 0547
  - Materials Science 0794
  - Mechanical 0548
  - Metallurgy 0743
  - Mining 0551
  - Nuclear 0552
  - Packaging 0549
  - Petroleum 0765
  - Sanitary and Municipal 0554
  - System Science 0790
- Geotechnology 0428
- Operations Research 0796
- Plastics Technology 0795
- Textile Technology 0994

PSYCHOLOGY
- General 0621
- Behavioral 0384
- Clinical 0622
- Developmental 0620
- Experimental 0623
- Industrial 0624
- Personality 0625
- Physiological 0989
- Psychobiology 0349
- Psychometrics 0632
- Social 0451

UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: Stephan Stephanson

TITLE OF THESIS: Psychological Dimensions in Rehabilitative Treatment of Craniofacial Deformities

DEGREE: Master of Education

YEAR THIS DEGREE GRANTED: Fall 1994

Permission is hereby granted to the University of Alberta Library to reproduce single copies of this thesis and to lend or sell such copies for private, scholarly or scientific research purposes only.

The author reserves all other publication and other rights in association with the copyright in the thesis, and except as hereinbefore provided neither the thesis nor any substantial portion thereof may be printed or otherwise reproduced in any material form whatever without the author's prior written permission.

(Signed) .....

(Permanent Address) 388 Elm Street
Winnipeg, Manitoba.
R3M 3P3

DATE: September 30/94

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommended to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled: PSYCHOLOGICAL DIMENSIONS IN REHABILITATIVE TREATMENT OF CRANIOFACIAL DEFORMITIES submitted by STEPHAN STEPHANSON in partial fulfillment of the requirements for the degree of MASTER OF EDUCATION in COUNSELLING PSYCHOLOGY.

H. Janzen (Supervisor)

J. Paterson

J. Wolfaardt

Date: September 30, 1994

Abstract

This study examined the pre-operatiive psychological measures of 46 patients undergoing treatment for craniofacial deformities by osseointegrated implants supporting removable prostheses. Fifteen of these patients also completed a post-treatment battery of questionnaires to assess changes in psychological measures. This patient population consisted of differing etiologies (i.e., congenital, traumatic, oncological) with a variety of injury sites (i.e., intraoral, extraoral). This group also contained a small population of patients with hearing loss treated with bone conducting hearing aids anchored by osseointegrated implants (BAHA). Psychological and psychosocial distress were measured using the Basic Personality Inventory (BPI) and the Campbell Scale of Well-Being. The results indicated significant differences between etiological groups in pre-operative measures of; interpersonal problems, persecutory ideation, anxiety, impulse expression, and deviation. In general the congenital group had the highest scores on the BPI subscales and the BAHA group the lowest. The post-treatment population consisted of patients with extraoral injuries of the following origins; trauma (9), congenital (4), or oncological (2). The results of this study indicated reductions in measurements of anxiety, self depreciation, depression, and denial ($p < 0.10$). Patients also indicated significant increases on measures of life satisfaction and well-being. Caution is noted in extrapolation of results due to inability to control several methodological dimensions of the study (i.e., age, control group, and questionnaire administration timing). The results, however, suggest that rehabilitation using osseointegrated implants and prosthetics can have positive effects on several dimensions of psychological and psychosocial health as measured by the BPI. The results also indicated a positive effect on the patients' sense of satisfaction and well-being. Taken together these measures suggested an overall reduction in emotional distress. Concluding comments include a discussion on ideas for improvements on the current study and suggestions for future research.

Acknowledgments

The author wishes to express his gratitude to all those who assisted in creating this thesis, whether that help came assistance, guidance, or by encouragement. My gratitude is extended to the following people:

Dr. Henry Janzen, chairman of the thesis committee, for his patience, his guidance, and his faith in my abilities.

Dr. Paterson, for participating in my committee and for his insightful and constructive criticism.

Dr. Rod Beattie for friendship, support, and wisdom that I have long since given up on ever "paying back."

The people of COMPRU, especially; Dr. John Wolfaardt, Val Perras, Trudy Johnston, and Philip Coss whose help was offered freely and with abundance and whose professionalism and care was evident in all my encounters with them.

The patients themselves. Each with a story of hardship and struggle is an encouragement to those more fortunate than themselves.

Finally, my family: Tracy, Johann, and Alex for their support through rough water; Jack, Brenda, Rob, Allison, and Scott for attempting to understand this process and for accepting my path.

TABLE OF CONTENTS

CHAPTER PAGE

1. INTRODUCTION 1

Statement of the Problem 1
Overview of COMPRU 2
Theoretical Framework of my Study 3
Questions Addressed in the Current Study 5
Definitions 5
Scope and Limitations of the Study 5
Overview of the Study 6

2. LITERATURE REVIEW 7

Overview 7
Theoretical Foundations: Physical Appearance and Psychological Health 8
Rehabilitation: Clinical Studies of Patient Populations 12
Plastic Surgery: Elective Change 13
Extraoral Craniofacial Disfigurement 15
Intraoral Osseointegrated Implants 18
Overview of Psychological Instrument (BPI) 21
Concluding Remarks 22

3. DESIGN AND METHODOLOGY 24

Overview 24
Patient Samples 25
Original Pre-Operative Sample 25
Pre-Post Operative Sample 28
Procedure 29
Questionnaires Administered 30
Demographic Questionnaire 30
The Campbell Well-Being Scale 30
The Basic Personality Inventory 30
Methodological Assumptions 31
Hypotheses 32
Data Analyses 33

CHAPTER PAGE

4. RESULTS 34

Pre-Treatment Population 34
Screening for Distorted and Invalid BPI Profiles 34
BPI Scale Scores For Pre-Treatment Group (n = 42) 36
Hypothesis 1.1 36
Analysis of Variable Differences Between Pre-Treatment Groups 38
Assumptions of Inter-Group Demographic Homogeneity 38
Hypothesis 2.1 39
Hypothesis 2.2-2.6 40
Hypothesis 3.1 41
Pre-Post Treatment Study 42
BPI Scale Scores For Post-Treatment Group (n = 15) 42
Hypothesis 4.1 42
Hypothesis 4.2 43

5. SUMMARY AND DISCUSSION 45

Summary 45
Conclusions 49
Recommendations 51

REFERENCES 53

APPENDIX A 57

APPENDIX B 58

APPENDIX C 59

APPENDIX D 60

APPENDIX E 61

LIST OF TABLES

Table	Descriptor	Page
3.1	Demographic Characteristics of Initial Study Sample ($\underline{n}$ = 46)	26
3.2	Diagnostic Characteristics of Initial Patient Population	27
3.3	Pre-Treatment Patients Grouped by Etiology and Treatment	27
3.4	Demographic Characteristics of Pre-Post Operative Study Sample	28
4.1	Means, Standard Deviations, and Ranges of BPI Standard Scores for Pre-Operative Group ($\underline{n}$ = 42)	37
4.2	Demographic Characteristics of Pre-Operational Sample by Groups	38
4.3	Between Etiological Group Differences in BPI Scale Scores	39

LIST OF FIGURES

Figure	Descriptor	Page
4.1	BPI Profiles Indicating Suspicion of "Faking Good"	35
4.2	BPI Profile Indicating Suspicion of "Fake Maladjustment"	36
4.3	Differences of Age Between Etiological Groups	38
4.4	Between Group Differences on the 'Optimism' Item on Happiness Scale	41
4.5	Between Group Differences on the 'Life as a Whole' Item of the Well-Being Scale	42

Chapter 1

Introduction

Statement of the Problem

People who experience anatomical mutilation or loss of body organs often experience a difficult period of adaptation to the loss. This process may involve adaptation to functional loss and/or adaptation to aesthetic changes. With self-concept closely tied to physical appearances this adaptation is often difficult; especially when defects or trauma involves the facial area. Aside from the medical adjustments there are frequently profound psychological and social adaptations. With these cases, one of the challenges faced by the medical staff is in helping the patient to successfully recover from, and adapt to, the loss (Kent, 1992; Kent & Johns, 1992, 1994; McEleney, 1992).

In the past, limitations in prosthetic technology made the repair, or masking, of defects a cumbersome and often inconvenient process. With advances in bone integrated prosthetics some of the difficulties involved in adaptation and recovery have been lessened. For example, external prosthetics were often attached with adhesives or mechanical devices such as headbands or spectacle frames. Failure of adhesives and limited aesthetic properties of other retention devices often made the remedy as traumatizing as the disfigurement. Research on the biocompatibility of materials revealed the unique properties of pure titanium with its ability to integrate with bone (cells will actually grow into the surfaces of the titanium implants). Application of this technology into rehabilitative surgery has resulted in *osseointegrated implants* that anchor devices such as dental bridges, prosthetic ears, eyes and other facial structures, as well as bone conduction hearing aids. These advances have not only resulted in the increase in functional stability of the prosthetics, they have also resulted in the improvement in their aesthetic qualities. Many of these patients have incorporated the prosthesis into their self-concept and /or their body-image (Kent & Johns, 1994; McComb 1993; Wilkes & Wolfaardt, 1994).

Research into the psychological forces affecting patient rehabilitation is considered to be very important by the professionals working in this area. It is the opinion and findings of professionals in oral and maxillofacial rehabilitation that one of the main reasons for failure in treatment has been poor assessment of, and assistance with, the patient's psychological condition (Jensen, 1978; Pruzinsky, Rice, Himel, Morgan, & Edlich, 1992; Wilkes & Wolfaardt, 1988).

Our study consisted of the following patient populations: individuals with facial defects, stomatognathic defects, or audiological difficulties requiring augmentation of bone conduction hearing. This study had several aims. The first goal was to describe a patient population in terms of psychological and personality variables. The psychometric instruments were used to characterize the general population, as well as several sub-populations. Secondly, the study aimed to assess the changes in psychological and psychosocial measures in extraoral craniofacial patients after the surgery and the fitting of their prosthesis. Thirdly, and in the long run, this study was intended to help establish a psychometric assessment battery that will help screen individuals for psychological illness and direct them to appropriate treatment programs.

Overview of COMPRU

The Craniofacial Osseointregration and Maxillofacial Prosthetic Rehabilitation Unit (COMPRU) is comprised of a team of specialists that provide reconstructive and rehabilitative care to patients with head and neck defects. The care offered by this unit involve both conventional prosthetics and osseointegrated implants (which are used to retain and support the prosthesis) for dental and facial abnormalities. The team is headed by Dr. J. Wolfaardt and Dr. G. Wilkes and has incorporated specialists in the areas of Dentistry, Plastic Surgery, Otolaryngology, Audiology, Prosthodontics, Cell Biology, Chemotherapy, Dermatology, Engineering, and Psychology. Together this team administers to the rehabilitative needs of each patient.

The COMPRU patient population includes intraoral dental reconstruction and prosthetics, extraoral reconstruction and prosthetics, autogenous reconstruction, and bone anchored hearing aids. Many of the extraoral cases in this population have had

construction of prosthetics for the ear, nose, or eye area. A large number of these patients were referred for alloplastic ear reconstruction; the defects caused mainly by congenital (microtia) or traumatic reasons. In some cases autogenous reconstruction was done by a plastic surgeon. In these cases the ear was reconstructed using the patients own tissues. When this procedure was not possible, or when previous attempts at reconstruction were unsuccessful, an osseointegrated prosthetic ear was considered.

Theoretical Framework of my Study

Due to the diversity in the medical history of our patient population the theoretical foundation for studying the psychological profiles and changes must be derived from a variety of research areas. Research regarding the psychological impact of changes to facial appearance includes: voluntary plastic surgery for mainly aesthetic reasons (Deaton & Langman, 1986; Napoleon, 1993); dental patients coping with edentulism (Blomberg & Lindquist, 1983; Jensen, 1978; Kent, 1992; Kent & Johns, 1991, 1994; Kiyak, Hohl, West, & McNeill, 1984; Kiyak, Beach, Worthington, Taylor, Bolender, & Evans, 1990); congenital craniofacial deformity (Bennett & Stanton, 1993; Pertschuk & Whitaker, 1987, 1988); oral, maxillofacial, or facial injury due to trauma (motor vehicle accident, burns, personal attack) (Bailey & Edwards, 1975; Jensen, 1978; Peterson & Topazian, 1976; Pruzinsky, Rice, Himel, Morgan, & Edlich, 1992); and deformity caused by disease or cancer (Langius, Bjorvell, & Lind, 1993; McEleney, 1992). Patients also vary in the extent and location of their injury (i.e. ears, scalp, eyes, mandible, maxillary area). Personality variables, as well as demographic variables such as age and marital status, are all important and vary within the population. As one can imagine, the medical and psychological struggles of individuals in each of these populations could vary due to any combination of these factors and at any time during their treatment. It would be naive to assume a simple patient profile.

Much of the extant research in this area centers around the "beauty is good myth." For instance, physical appearance is frequently cited as central to psychological well-being. Commonly, it is assumed that physical attractiveness is on a continuum. With extremes ranging from godly beauty to extreme ugliness, the majority of people are

assumed to fall somewhere in between (Bull, 1983). More specifically, in an article by Pertschuk and Whitaker (1987) the authors noted that "attractive individuals are typically perceived as kinder, brighter, more likable and more successful; they are more likely to be hired and at better salaries" (p. 163). Often, in this research, the assumption is then made that craniofacial deformity can be equated with extreme unattractiveness (Bennett & Stanton, 1993). For these reasons it is thought that the craniofacially deformed individual is subjected to social prejudices and negativity. Authors of recent literature caution against this generalization of research findings and suggest that craniofacially deformed individuals may have significantly different social experiences than unattractive individuals. For example, in the cleft-palate literature, Katz (as cited in Bennett & Stanton, 1993) postulates that the stigmatized individual is subjected to social ambivalence. The experience of social ambivalence is marked by strong positive feelings of sympathy and efforts of help for the handicapped contrasted with strong negative feelings toward and avoidance of the stigmatized individual. Whether the stigmatized person experiences either generalized negative social reactions or social ambivalence the results are the same; negative psychological and social stressors (Pruzinsky, 1992).

The majority of our patient population has had to cope with highly visible abnormalities. For those who have had injury inflicted upon them, either through accident or disease, their struggle involves, as McEleney (1992) stated, "the death of their face" and a violent adjustment to a new self image. For others, born with craniofacial defects or having early childhood facial trauma, their plight involves "negative social expectations and treatment leading to impaired social behavior and self-concept." (Pertschuk & Whitaker, 1987).

In general, research indicates that osseointegrated implants enhance both functional capabilities and have positive effects on psycho-social variables. Much of this research has been done in the area of dental implants (Blomberg & Lindquist, 1983). In the area of maxillofacial restoration with traditional prosthetics Sela & Lowenthal (1980) found that treatment had a positive effect on patient self-esteem and attitude toward life in 85% of their patient population. The study also found that the major discrimination factor

influencing the response of maxillofacial prosthesis was the original diagnosis, with more trauma patients showing psychological improvement than congenital, or cancerous patients (in that order). As well, these results were qualified in terms of other factors that categorize these populations.

Questions Addressed in the Current Study

a) Does this group of patients differ from the norm populations on measures of psychological and psychosocial dimensions?
b) Are there differences in psychological measures based on the etiology of injury or defect for all groups combined?
c) Do the etiological groups differ from each other in terms of overall happiness and sense of well-being?
d) Are there changes in psychological measures for those patients who have undergone rehabilitative treatment?

Definitions

The following definitions will be used for this study:

1) *Craniofacially Deformed* - in the general body of this study the term refers to patients with injuries or defects to the head region, including: eyes, nose, and cheek areas; mandibular, dental and jaw structures; and temporal / parietal; skull and ear structures.

2) *Intraoral surgery* - techniques involving the restructuring and installation of osseointegrated implants for dental, maxillary, and mandibular regions.

3) *Extraoral surgery* - techniques involving the restructuring and installation of osseointegrated implants for face, skull, and ear regions.

Scope and Limitations of the Study

There are several factors which should be considered when interpreting the results of this study. As there were only 46 subjects in the pre-treatment group and 15 in the post-treatment group, generalizability of the results should be limited to populations with comparable characteristics. The concern for small sample size was heightened when using the etiological subgroups with between 6 and 14 patients per group.

Another limiting factor was the inconsistent method of administrating questionnaires. Several aspects of the questionnaire administration were not controlled, such as the time between; injury date and pre-treatment testing, pre-treatment testing and surgery dates, and prosthesis fitting and post-treatment testing. Also, due to "out-of-town" patients and scheduling some of the instruments were mailed to the clients, who were asked to complete the questionnaires for the post-treatment assessment.

Finally, response bias may have been a factor influencing the patient's approach to the assessment instruments. The psychological assessment was presented to subjects as an exercise to help to meet the rehabilitative needs of the patients. Some of these patients, however, may have seen this as a screening process for which they had to answer in a certain manner in order to be accepted into the program.

Overview of the Study

Chapter 2 of this thesis is a review of the literature regarding research on the psychological and psychosocial impact of craniofacial and dentofacial prosthetics. A synopsis of relevant literature on self-concept and physical appearance is discussed. A review of related studies in the areas of dental and craniofacial prosthetics, as well as literature on craniofacially traumatized patients and cleft-palate reconstruction is presented. Also discussed is the use of standardized psychometric instruments in assessing the rehabilitative needs of craniofacial patients.

In Chapter 3, the methodology and design of the study is described. Results are then presented in Chapter 4. Chapter 5 contains the summary, and discussion of the study, as well as suggestions for future research.

Chapter 2

Literature Review

Overview

Several psychological factors are involved in the rehabilitation of patients undergoing surgical treatments. When the injury or defect (and subsequent surgery) involves sensitive areas such as the head, face, and mouth it is not hard to imagine the impact the procedure would have on both the psychology and psychosocial aspects of the individual. Facial and oral reconstructive surgery and prosthetic devices have traditionally been used to correct deformities. Osseointegration was introduced as a technique for dental rehabilitation in the early 1950's by Dr. Per-Ingvar Brånemark (Blomberg, 1985). The use of this technique was introduced later to the area of extraoral prosthesis attachment. Although there has been extensive research on the psychological factors of osseointegrated dental bridges for edentulous patients, there has been comparably little research done on the psychological variables of rehabilitation for patients treated with osseointegrated extraoral prostheses.

Psychological instruments have been traditionally used in plastic and reconstructive surgery for three reasons. First, it has been to screen patients for psychotic symptoms or extreme emotional disturbances that may affect candidacy for surgery (Deaton & Langman, 1986; Peterson & Topazian, 1976). Second, it has been to assess the psychological needs of individuals undergoing rehabilitation (Deaton & Langman, 1986; McEleney, 1992). The third reason involves the use of instruments in ongoing research. Research is often conducted in conjunction with the above two to help better understand the rehabilitative needs of these patients with the intention of providing programs suited to the individual patient needs.

As referred to in the introductory chapter, the patient population at COMPRU is comprised of people with various craniofacial defects or injuries involving areas such as teeth, face, and ears. For the most part etiologies include congenital, traumatic, and oncological. Patients are treated by a number of rehabilitative procedures (autogenous

reconstruction, conventional prosthetics, osseointegrated prosthetics). In addition there is also a population of patients treated, not for physical disfigurement, but for hearing impairment. It is reasonable then to find both common and disparate features with the psychological and psychosocial profiles of the individuals in the whole patient population. It is also reasonable to find distinct groups of psychological profiles based on etiologies. To review research relevant to these groups one needs to explore the literature from a variety of treatment populations; both identical to and different from the present study group. For example, studies addressing populations similar to the present one are found in the oral and maxillofacial surgical area. Studies that are relevant to, but different from, this population are found in the areas of burn rehabilitation, cleft palate rehabilitation, and voluntary plastic surgery.

Four areas of research that are reviewed in the present chapter. The first addresses the importance of physical appearance to an individual's psychological and social health, and the theoretical foundations that account for the link between appearance and psychological health. The second area is an exploration of similar psychological research done with patients undergoing rehabilitative and reconstructive surgery for the dental and maxillofacial region. Third, is a brief presentation of similar psychological studies for patients that are facially injured, including, cleft-palate and burn research as well as patients treated with non-osseointegrated prostheses. Finally, a brief review of research employing the Basic Personality Inventory is presented to establish the relevance of the use of this instruments in the present study.

Theoretical Foundations: Physical Appearance and Psychological Health

Several studies have demonstrated the importance of physical appearance in a person's self-concept and psychosocial health (Bull, 1983; Bull and Rumsey, 1988; Patzer, 1985; Pertschuk & Whitaker, 1987, 1988). Emphasizing the relationship between body image and psychological health, Allport (in Bailey & Edwards, 1975) described this variable as "the life long anchor for self-awareness" (p. 534). Tobiasen (1984) made the argument that the effects of appearance on expectations, treatment, and behaviour may serve as a basis for understanding the psychosocial problems in facial deformity. This argument is based on the literature on attractiveness and has been termed the "*beauty is*

good" phenomenon (Bennett & Stanton, 1993). For example, some of the research has indicated that attractive individuals are perceived as kinder, brighter, more likeable, and more successful (Dion, Berscheid, & Walster, 1972). It was also found that attractive individuals are more likely to be hired, their work perceived more favourably, and mistakes judged less harshly than unattractive individuals (Cash, Gillen, & Burns, 1977). A primary assumption that follows these studies is that unattractive individuals are misjudged and poorly treated. Social and peer relationships are important for both the development of a healthy self-concept and for emotional well-being. Moreover, the notion that emotional distress arises from repeated painful developmental experiences is consistent with both the Social Learning Theory and the Psychodynamic model. It makes intuitive sense then, that an unattractive physical appearance would lead to emotional distress (Bennett & Stanton, 1993).

Individuals with facial deformity are subject to the psychological and social burden of stigmatisation. The stigmatisation process involves the labelling of an individual as a deviant based on his or her membership in a social category. As such, they become victims of prejudice, discrimination, and of the social and economic outcomes of these evaluations (Bull & Rumsey, 1988). These authors indicated that individuals with facial deformities are not accorded the same social respect that other individuals receive. The results of this differential treatment includes feelings of powerlessness in social interactions, social isolation, and loneliness. An example of this lack of respect includes a loss of privacy. In social situations most people are granted social anonymity; a privacy given by social practices such as proximal space and eye aversion. Facially deformed individuals often have this privacy violated with naked stares, startle reaction, "double takes", whispering, remarks, personal questions, advice, manifestations of pity or aversion, laughter, and verbal assaults (Macgregor, 1990). Factors such as these are attributed to social withdrawal and psychological distress. Because of the importance of peer acceptance in psychological development, social withdrawal often results in later experiences of anxiety, depression, and loneliness (Pruzinsky, 1992).

In the cleft palate research the most popular theory for the development of emotional dysfunction in craniofacially deformed individuals is the "*reflected appraisals*"

or the "*looking glass self*". As an extension of the "*beauty is good*" phenomenon this theory purports that craniofacially deformed children are at a developmental disadvantage emotionally because they "incorporate a negative societal view of facial deformity into their self-concept" (Bennett & Stanton, 1993, p. 407).

Four hypotheses are proposed by Pertschuk and Whitaker (1987) to be the natural extensions of the results of the physical attractiveness research;

1. If craniofacial deformity causes negative social expectations and treatment leading to impaired social behavior and self-concept, then the longer this process goes on, the worse the psychosocial effects.
2. If improvement in appearance positively influences social expectations and reactions, then behavior and self-concept should correspondingly improve.
3. Conversely negative changes in appearance should negatively affect social perception and treatment with deterioration in behavior and self-concept.
4. Deformities that result in perception of greater unattractiveness should be associated with poorer social expectations and treatment and poorer behavior and self-concept. (p. 164)

These hypotheses are not directly supported by research and are offered only as a theoretical context in which to view the complex interactions of appearance and psychological health (Pertschuk & Whitaker, 1987).

In the literature addressing the theoretical basis for the effect of craniofacial disfigurement on psychosocial development, criticisms and cautions are noted by several authors (Bennett & Stanton, 1993; Pertschuk & Whitaker, 1987; Peterson & Topazian, 1976). Specifically, these authors question the assumption that the development of a healthy self-concept and emotional stability is based primarily on physical appearance. Certainly other factors contribute to the development of a positive self-concept and emotional stability. These variables may include: personality factors, family circumstances, and family support. It is also the interaction of these variable that contribute to psychological distress and maladjustment. In fact, some of these influences may work to ameliorate the potential negative impact. For example, certain attributes of the individual, such as intelligence, sense of humour, positive outlook, and temperament, may provide positive influences on psychosocial development (Pruzinsky, 1993).

Pertschuk and Whitaker (1987) suggest that the basis of the line of reasoning used to establish the connection between attractiveness in the development of psychological health is purely theoretic and yet to be substantiated. Support for this view resides in a recent meta-analysis of the physical attractiveness literature (Eagly, Makhijani, Ashmore, & Longo, 1991). This research indicated that some of the traditional assumptions (or conclusions) may not be valid. Their analysis showed that physical attractiveness has little or no effect on perceptions of intelligence, honesty, virtue, helpfulness, potency, or general emotional adjustment. Their results did suggest, however, that beauty does influence the impression of a person's ability to negotiate in social situations (Bennett & Stanton, 1993).

Another reason one must be cautious resides in the assumption of applying the appearance literature to the craniofacially deformed population. Notably, one must critically examine the assumption which equates physical unattractiveness to physical deformity. The theoretical basis underlying this research assumes that the craniofacially deformed population does not differ from the normal population in any fundamentally important manner. In other words, the factors that influence the development psychological and emotional stability of the craniofacially deformed individuals differs from non-disfigured individuals only in degree and not in kind (Bennett & Stanton, 1993). Inconsistencies in research findings may necessitate the development of a conceptually different approach to understanding the elements of this relationship. An alternative approach to understanding emotional and psychological development in craniofacially deformed individuals is based in the social science literature on physical stigmata. This distinction between unattractiveness and stigmata literature emphasizes fundamentally different approaches to the development of self-concept (Pertschuk & Whitaker, 1987). Crocker and Major (1989) postulate an *attribution-based model* to account for some of the findings that are inconsistent with the assumptions made in the literature. After 20 years of research on the impact of stigmatism these authors conclude that "prejudices against members of stigmatised or oppressed groups does not result in lower self-esteem for members of those groups" (p. 611). They go on to suggest that some individuals use their stigmatised status to enhance their self-esteem. This theory is consistent with many

of the studies on self-esteem in craniofacially deformed patients in which self-esteem levels are consistent with normal populations. The attribution-based theory postulates that the stigmatised individuals will attribute any negative feedback to their stigma, thereby protecting their self-esteem (Crocker & Major, 1989). In other words, they will attribute social rejection or criticism to the fact that they have a deformity and not to more general aspects of self. Theoretically, it is conceivable that the outcomes of surgery, which take away their stigma, can be stressful for the aforementioned reasons.

In summary, to put these theoretical notions into context several points need to be made. First, much of the literature that has just been presented is theoretical. Second, the theoretical approaches deal in terms of broad concepts such as self-esteem, self-concept, and psychosocial development. Generally, there is a lack of consistency in the definitions of these terms and often incorporate other constructs such as depression, anxiety, and social skill development. Third, many of the notions are based on studies which examine psychosocial development in congenital or childhood samples and may not wholly apply to victims of traumatic injury. However, much of it deals with self-concept and self-esteem as developmental factors that may be fundamentally different between the ages of birth to six years than, for example 13 to 19 years, or 36 to 45 years.

Despite these controversies in the theoretical domain, the one long-term evaluation of the psychological and social impact of facial deformity is that

> these patients all manage to cope with their deformity in individual ways. However, for every one of them this had been a formidable and engulfing task …all of the patients went through periods of emotional turmoil and crisis related to the way the looked. All experienced periods of marked depression …during which personality, emotional and social functioning were noticeably impaired. Yet despite the precariousness of their everyday lives, they have survived. (Macgregor, 1989, p. 5 as cited in Pruzinsky, 1993)

In short, despite the theoretical confusion, individuals with craniofacial deformity are at risk for experiencing psychological distress.

Rehabilitation: Clinical Studies of Patient Populations

Having reviewed the theoretical foundations, the focus turns to previous clinical research. As the current study aims to show both psychological profiles of different

etiological groups before treatment, and changes in psychological dimensions (before and after treatment), at least two areas of research must be addressed. That is, we must review research that identifies pre-surgical psychological profiles and their effects on the rehabilitation process (i.e., the screening process). Also we must review research that reveals changes in psychological dimensions, such as emotional and psychosocial indicators. The clinical research is derived from patient populations of: burns, cleft palates, dentofacial, maxillofacial, and voluntary plastic surgery.

In general there is a paucity of research analyzing the pre-operative psychosocial variables of craniofacial patients. The research that has been done in this area is widely criticized for lack of methodological rigor and lack of solid theoretical foundation. Much of the experimental research is conducted within the medical community in which the favored theoretical background is the Psychodynamic model. Jensen (1978) suggested that because Psychoanalytic theory presumes an ideal personality, it is often assumed that no control group is required. Several authors suggest that the results of any of the research should be regarded with caution due to the predominance of small sample sizes, poor experimental design, lack of adequate controls, retrospective designs, and vaguely defined measuring criteria (Jensen, 1978; Kent, 1992; Kent & Johns, 1991, 1994; Kiyak, Hohl, West, & McNeill, 1984). Jensen (1978) pointed out that the majority of the literature on the subject was theoretical, speculative, and anecdotal. Although in general this seems still to be true, there appears to be some effort to change this trend (Kent & Johns, 1991, 1994; Kiyak et al., 1990).

Plastic Surgery: Elective Change

The results of research in elective plastic (cosmetic) surgery is presented for two reasons: 1) to discuss factors addressed in pre-surgical screening, and 2) to discuss aspects of post-operative changes in social and psychological variables that are attributed to the changes in physical experience.

It has long been established that pre-operative psychological measures are useful in the screening process of elective plastic surgery (Napoleon, 1993). The reasons for the screening process varies. Jensen, (1978) indicated that patients who were identified pre-operatively as psychologically disturbed (psychosis or neurosis) had post-operative

problems more often than non-disturbed patients. Based on this factor, some plastic surgeons make it a policy to reject (i.e., refuse surgery) psychologically disturbed patients. Other surgeons utilize the results of the psychological assessment to help their clients cope with the changes brought about by plastic surgery (Napoleon, 1993).

People with certain personality types are also known to be generally dissatisfied with the outcomes of surgery and interfere with their own rehabilitation. The results of a study by Napoleon (1993) indicated that three personality types account for the majority of dissatisfied cases, and also the majority of litigation cases; these are Narcissistic, Borderline, and Obsessive-Compulsive Personalities.

The psychologist's role in the elective plastic surgical procedure is also to identify important psychological factors that help assess patient rehabilitation; their progress and their distress. One factor that was found to be important is the patient's pre-treatment expectations of surgical outcome. In the elective plastic surgery population, expectations of outcomes were found to be significantly related to post-treatment satisfaction (Jensen, 1978). High or idealistic expectations were frequently the basis for disappointment after surgery. Unrealistic expectations are often related to the degree of "beauty" that can be attained through surgical treatment and also related to the impact that the changes in physical appearance will have on social relationships. Expectations are also an important factor for patients undergoing oral and maxillofacial surgery for many of the same reasons. Kiyak, Vitano, & Crinean (1988) showed that expectations are not only instrumental in the satisfaction with rehabilitative surgery, but further influences patient coping strategies presents during surgical treatment. These authors found that patients who anticipated fewer problems (avoidant copers), reported better psychological outcomes than those that anticipated numerous problems (vigilant copers). These authors suggested that vigilant copers anticipated the pain and difficulties of surgery. Therefore, there is a heightened anticipatory anxiety, pre-surgically, and these authors suggest that contributes to self-fulfilling prophecy.

Depression is an additional psychological variable often examined in this patient population. With unrealistically high expectations, or even moderate expectations that are unrealized, post-operative depression is often watched closely due to the negative effects

that it can have on recovery (Napoleon, 1993). Observing that that depressive reactions to surgery appear to be common to some degree, Deaton and Langman (1986) suggest that it is a natural part of the process of adaptation to the change. These authors also suggest that post-surgical levels of depression that deviate from the normal range may be more reflective of premorbid conditions than a reaction to unsatisfactory outcome.

In the general plastic surgery literature, several aspects of psychological and social functioning are reported to be affected. Patients often attribute these changes to alterations in their appearance (Deaton and Langman, 1986; Jensen, 1978; Napoleon, 1993). In a meta-analytic review of the literature Jensen (1978) found that patients often credited their change in physical appearance with increases in; self-confidence, friendliness, social confidence, personal comfort, self-esteem, and happiness. Several of the studies also indicated reports of improved relations with the opposite sex. Jensen also found research to indicate that the changes in physical appearance was credited with decreases in; dependence on families, self-consciousness, and shyness. Further, in several elective plastic surgery studies, as well as several dentofacial surgery studies, patients reported that their personalities had changed because of their changes in appearance.

The presentation of some of the general findings in this area gives the reader an idea of the focus of the research on psychological outcomes and concerns in the area of plastic surgery. Overall, the results of the studies of the elective plastic surgery population serves as a starting point from which to review the studies of psychological factors involved in the rehabilitative treatment of craniofacial deformities. Comparisons of these two patient populations have indicated that patients undergoing rehabilitative surgery for craniofacial deformities have fewer emotional problems and have more realistic expectations of treatment outcomes (Jensen, 1978).

Extraoral Craniofacial Disfigurement

Although many of the findings of the plastic surgery literature generalize to the craniofacially deformed literature there are several key elements of the latter population that make it distinct. When writing about the positive changes brought about by surgical intervention, there is not always a distinction made between voluntary cosmetic surgery and reconstructive surgery because of defect or injury. Probably the biggest distinctions

between these populations are degree of injury, elective versus essential surgery, and motivation. For the craniofacial deformed the motivation is almost always based on a desire to attain, or return to, a state of normal function and appearance. For the elective plastic surgery population the motivation for change is often based in an unrealistic sense of perfection (Petersen & Topazian, 1976). Despite these differences the focus of the rehabilitation process is the concern for adaptation to change in appearance and the psychological dimensions involved.

In an effort to provide health professionals with some guidelines about the psychological dimensions of this patient population Bailey and Edwards (1975) pointed out that special attention needs to be given to the emotional status of patients during the entire diagnosis-treatment-rehabilitation sequence. Signs of depression, loss of appetite, dejection, withdrawal, and irritability. The authors indicated that depression was a major impediment to the rehabilitative process. MacGregor (in Bailey and Edwards, 1975) indicated that the following psychological characteristics in patients who showed successful recovery. Notably there were changes in the following dimensions: increased spontaneity, more social activity, improved self-esteem, greater confidence, reduced self-consciousness, and increases in energy levels.

In a study by Sela & Lowenthal (1980), patients undergoing maxillofacial restoration using traditional prostheses reported improvement in measures of physical and psychological "fitness" by means of a 25 item true / false questionnaire. The authors equated this measure with the term self-esteem and used it as the dependent measure. They found that the most discriminating factor accounting for improved levels of "self-esteem" was the original diagnosis. Improvements were most noted for the traumatic, followed by congenital, and then oncological patients.

Pertschuk & Whitaker, (1987; 1988) found that, relative to a matched comparison group, children with congenital craniofacial anomalies demonstrated difficulties with self-concept, anxiety, introversion, home and school behaviour, and social encounters. After surgical treatment only trait anxiety showed clear improvement, although measures of inhibited and hyperactive behavior showed trends toward positive change. Any changes in psychological or social functioning in this study if present, were noted to be subtle.

Noticeable and satisfactory cosmetic improvements were reported by both parents and patients.

For adolescent patients the results of testing revealed more significant difficulties than the child population (Pertschuk & Whitaker, 1987). "Where the later-group children demonstrated subtle limitations, the adolescent-adult patients tended to exhibit obvious disturbance" (p. 166). Problems were noted in social adjustment, self-concept, depression, and anxiety. They also found considerable variation in the population; over 30 percent demonstrated abnormal scores on one or more tests and 50 percent revealed entirely normal test profiles. Patients with emotional distress appeared to be "low grade" and chronic. However, a small portion of the total group was sufficiently distressed to warrant psychiatric intervention.

For trauma patients, Pertschuk & Whitaker (1987) found that just under half of the of those tested scored in the "problematic range" on one or more measures of psychosocial difficulties. This effect was evident independent of the time that had elapsed since the trauma occurred (some patients were tested years after the accident). Depression was the most common difficulty, followed by problems with psychosocial adjustment. For trauma patients other factors often exacerbated rehabilitation. For victims of violence or violent accidents the stress caused by the event and the scars which remind them of the event are also sources of disturbance. The anxiety created by many traumatic events are felt long after that event. These authors also found that trauma patients had two sources for their fears: unattractiveness and identity problems. In other words, the patients had fears of social rejection and they no longer recognized themselves in the mirror. In this study, the majority of patients in the sample population felt a need for psychiatric help while 10 percent required psychiatric hospitalization. From their study Pertschuk and Whitaker (1987) concluded that little is know about the psychosocial aspects of appearance change and that the area is comparatively understudied.

Another similar area of facial surgery that considers the psychological dimensions involved in rehabilitation is orthognathic reconstruction. As with the elective plastic surgery population (cosmetic) often times the individuals elect for the procedure and are motivated less by functional necessity and more for aesthetic reasons (Auerbach, Meredit,

Alexander, Mercuri, & Brophy, 1984; Kiyak et al., 1982). In this group pre-treatment measures of self-esteem, body image, and neuroticism were within the normal range of scores. Post-treatment measures of satisfaction were positive in most cases. Increases in satisfaction with body-image, especially facial profile, were also noted. Much like previously mentioned studies, when prompted with researched designed survey questionnaires, patients reported improvements in social relationships, self-confidence, and even reported that their personalities had changed (Kiyak et al., 1982).

In the area of burn rehabilitation, screening for psychological difficulties experienced by this population is also important. In the burn area in general there are three critical psychiatric variables to assess: substance abuse, post-traumatic stress disorder, and depression. Similar to other craniofacial populations burn patients also have to cope with losses of; appearance, employment status, sexual attraction, and social status. In the entire population as a whole, emotional distress is a common experience with elevated levels of anxiety, depression and feelings of loss of control. Depression has been reported to be a prevalent occurrence in 20 to 27 percent of the population (Ward, Moss & Darko, 1987). As with other craniofacial populations, burn patients with premorbid psychological and social difficulties are more likely to express difficulties during phases of rehabilitation (Pruzinsky, Rice, Himel, Morgan, Edlich, 1992).

Intraoral Osseointegrated Implants

With the treatment of intraoral defects (orthognathic, maxillofacial, and dental) several studies have focused on the psychological variables involved. There are several reasons to introduce this research into the current literature review. First, as much of the theory attributes changes in psychological variables to changes in appearance, the loss of teeth or jaw structures is argued to be just as devastating to a person's appearance as a more visible "external" stigma. Generally, studies indicate that the motivation for the pursuit of dental rehabilitation with a prosthesis is a mixture of aesthetics and function. Most investigators have found aesthetics to be a very important motivating factor (Auerbach, Meredith, Alexander, Mercuri, & Brophy, 1984).

A second justification for using the intraoral osseointegrated prosthesis literature is the experience of incorporating the prosthesis into "self" expressed by different

populations. It is the experience of many dental patients with osseointegrated prosthetics that after a time they incorporate the prosthesis into their self-image and are no longer conscious of it (Blomberg, 1985). This experience has also been reported to this author by patients with external prostheses. The psychological incorporation is derived, in part, from the stability provided by the osseointegrated implants. This stability fosters a convenience that allows the patient to use the prosthetic for longer periods of time.

A third reason for presenting this literature is the fact that, as mentioned earlier, little research has been done in the area of extraoral prosthetic rehabilitation by osseointegrated implants. The majority of research on the psychological aspects of this rehabilitative technique has been in the area of dental implants. For these reasons the following findings are presented.

In a recent review (Kent, 1992) examined the effects of osseointegrated dental implants on the psychological and social well-being of patients. The author presented several common findings in the literature as well as issued detailed and overall concern for methodological difficulties. Some of these concerns included: limitations inherent in retrospective studies, the use of non-standardized test instruments and poorly designed questionnaires, response bias, and most importantly lack of control comparison groups. Despite these criticisms, several of the studies mentioned in Kent's review present relevant findings and have some degree of methodological soundness.

From a study that used a retrospective design and non-standardized questionnaires Grogono et al., (1989) found significant differences in attitudes between patients' experiences with traditional dentures and their current osseointegrated prostheses. These authors reported that patients who have had an implant prosthesis indicated improvements in: ability to speak, relations with opposite sex, confidence, feelings about self, and avoidance of smiling. These patients also responded in positive ways for most of the items in the happiness questionnaires.

In studying the differences between the osseointegrated implants and the conventional denture Blomberg (1985;1991), stated that a portion of the edentulous patients suffer from psychological problems because of their removable dentures. Specifically these problems include; psychosocial impairment with symptoms of

avoidance behaviour, phobic reactions, and contact problems (Blomberg, 1985). A prospective study by Blomberg and Lindquist (1983) found that approximately half of both the treatment and the control group attributed a deterioration in their way of life to their dental situation. The majority of patients reported pre-operative nervous disorders that led to social problems requiring professional psychological treatment. Of the 26 treatment patients in this study, 24 of them reported that psychosocial difficulties had improved. The authors also showed that the effects were still present at the time of a two year follow-up. These results validated earlier findings (Blomberg, Brånemark, & Carlsson, 1984 as cited in Blomberg, 1985). In this study 189 patients, who had been treated in the previous 14 years, were surveyed to determined their psychological adaptation. Of this patient population 80% reported an improvement in psychic health due to the implanted prosthesis. The reports also indicated a marked and lasting improvement in security and self-esteem; with a resolution to their previous psychosocial problems.

Kiyak and associates also conducted several studies on the psychological variables involved in maxillofacial surgery. In researching the effects of osseointegrated dental implants on psychosocial variables Kiyak et al. (1990) found a dramatic reduction in "problems with physical appearances" and "socializing" (or being in public) compared to pre-treatment measures. Specifically, there were significant improvements in ratings of body image, including facial image than pre-surgical groups. No changes were found in personality variables measured pre-post operatively (as measured with Eysenck's Personality Inventory (EPI)). This supports the findings of an earlier study (Blomberg & Lindquist, 1983). However, Kiyak et al found a correlation between high scores in neuroticism (measured on the EPI) and post-operative problems with social functioning. The also found that this high neuroticism group were less satisfied with treatment results. The conclusions from this finding were that scores of neuroticism, anxiety, and other emotional states, are important variables to consider in screening patients. The implication of these results is not to exclude these patients from treatment, but to consider the importance of providing psychological support for patients during stages of treatment.

As research in this area continues there is some indication that methodological designs are improving. In a prospective study, Kent & Johns (1991) using standardized instruments (General Health Questionnaire) and a comparison control group reported substantially lower post-operative levels of psychological distress. This was confirmed in a follow-up study (Kent & Johns, 1994) in which a comparable group of dental patients receiving conventional denture replacement were administered the same questionnaires as the previous 1991 group. The results indicated that, similar to the earlier osseointegrated implant group, the denture group had higher than normal pre-treatment distress levels. However, unlike the osseointegrated group, the denture group's distress levels did not decline after treatment. Again there was also a decline in the number of disabling symptoms reported in this group. Because the two methods were treating the same disability, edentulism, it was concluded that the specific properties (stability and incorporation) of the osseointegrated implants accounted for the differences in psychological effects (Kent & Johns, 1993). Finally, a third study (Kent & Johns, 1993) confirmed these findings and also showed that the improvements were stable when re-tested 18 months after treatment.

Overview of Psychological Instrument (BPI)

The Basic Personality Inventory (BPI) is a psychometric instrument established using both psychiatric and "normal" populations. Although not strictly a clinical instrument, it was established as a measure of various dimensions of psychopathology (McReynolds, 1989). The BPI scales measure personality dimensions (Denial, (Den); Interpersonal Problems, (IPs); Alienation, (Aln); and Impulsive Expression, (ImE)); neurotic dimensions (Hypochondriasis, (Hyp); Depression, (Dep); Anxiety, (Anx); Social Introversion, (SoI); and Self Depreciation,(SDp)); and psychotic tendencies (Thinking Disorder, (ThD), and Persecutory Ideation,(PId)). The design of the scale allows individual analysis of psychological variables such as Depression, Anxiety, and Self Depreciation as well as profile analysis of all twelve measures. (Jackson, 1989).

Jackson (1989) suggested organizing the scales into five broad categories based on logical families.

1. Inadequate or Deviant Socialization and Impulse Control (IPs, Aln, ImE).
2. Mood and Personal/Emotional Adjustment (Dep, Anx, Hyp)
3. Cognitive Functioning (PId, ThD)
4. Self Perception and Sociability (SDp, SoI)
5. Critical Deviant Behaviors (Dev)
6. Test Taking Style (Den) (p.4).

Factor analysis of the scales has also revealed logical families of psychometric characteristics. Studies comparing responses on both the MMPI and the BPI show that 96% of the variation shared by these two scales can be accounted for by five factors. The five factors are labeled:

1. Inadequate Impulse Control (ImE, IPs, Anx, Aln, Den)
2. General Social Anxiety (Anx)
3. Depression and Somatization (Hyp, Dep)
4. Psychotic Processes (PId, ThD, Aln, Dev)
5. Depressed Withdrawal (SoI, SDp, Dep, Aln) (Jackson, 1989, p. 65)

As an instrument of personality assessment the BPI has been used as a screening tool and as an instrument to evaluate treatment program. It has been used in criminal populations and in patient populations for the following treatment programs; alcohol, chronic renal failure, fibrositis and pain management, and eating disorders (Jackson, 1989). A study in the success of an alcoholic treatment program tested individuals on two separate occasions, before and after the program, and concluded that the instrument was sensitive to changes brought about through treatment (Hoffman & Jackson, 1988 as cited in Jackson, 1989). It therefore appears that analysis of psychological factors in our patient population using the BPI is justified. Further, the analysis can be achieved with either individual scales or groups of scales making up families of psychological dimensions.

Concluding Remarks

In sum, a review of the literature lends support for the notion that rehabilitation of physical injury or defect is largely influenced by psychological variables. Although the theoretical foundation of the nature of the relationship between appearance and psychosocial functioning is not clear, it is apparent that appearance is important to

psychological well-being for most people. In facially disfigured individuals the nature and social implications of the injury are strong determinants of emotional and psychosocial distress. Identifying elements of distress experienced by the patients would be beneficial for both the professionals implementing rehabilitative care and the individual patients. Clearly, because of the myriad of possible factors influencing each patients situation, the approaches to rehabilitation will be highly individualized. However, general characteristics of the populations and subpopulations will help to guide those rehabilitative programs. It is reasonable to assume that individuals having facial deformities will experience various forms of psychological and social distress relating to their condition. It also appears reasonable that efforts made in alleviating some of the conditions related to the distress will be beneficial in a variety of ways. It therefore follows that attaining a relatively stable degree of aesthetic normalcy will positively effect the psychological and social situation of these patients.

Chapter 3

Design and Methodology

Overview

It has been shown in the literature that people undergoing rehabilitation for craniofacial abnormalities often experience varying degrees of psychological and psychosocial struggles. This has been found in patient populations with Intraoral (dental) prosthetics (Blomberg & Lindquist, 1983; Kiyak, Beach, Worthington, Taylor, Bolander & Evans, 1990; Kent, 1992) and Extraoral (facial) prosthetics (Sela & Lowenthal, 1980). Concerns for psychological health include depression, social introversion, neuroticism, and hypochondriasis (Blomberg, 1991). Other studies have found that patients undergoing intraoral surgery generally have an intact ego and an accurate self-concept (Kiyak, Hohl, West, & McNeill, 1984). The variables focused on in these studies include measures of self-esteem, body image, neuroticism, and locus of control.

Research into psychological factors and their role in the treatment of patients with craniofacial deformity have been criticized for three reasons. Firstly, there is a concern for the lack of standardized psychological measures used in the studies. Secondly, there is a concern for the lack of the use of control groups in studying the impact of treatment (Kent, 1992). Thirdly, small sample size in many of the studies limits the confidence in, and the generalizability of, the results. The current study addresses some of these concerns

As a well established and standardized psychometric instrument, the Basic Personality Inventory (BPI) (Jackson, 1989) was chosen to measure clinical and personal attributes of patients treated at COMPRU. Another standardized scale, Campbell's Scale of Well-Being, was used also to measure life satisfaction. Although a control group was not utilized for this study, comparisons were made between etiological groups. In the second part of the study post-operative measures were compared to pre-treatment measures.

Results of the questionnaires were analyzed and compared to the norm populations that had been used to establish the reliability and validity of the instruments. Results from

the various subgroups were also analyzed to provide a general profile of this patient population using one-way Analysis of Variance (ANOVA). For the second part of the study, patients who had undergone surgery and had lived with a prosthesis for a length of time, completed a second set of questionnaires. The suspected variables of concern, (Depression, Anxiety, Hypochondriasis, Self Depreciation, Social Introversion, Alienation, and Interpersonal Problems) were then analyzed using paired student's T-test in a repeated measures design.

Patient Samples

Original Pre-Operative Sample

Subjects for this study were a select group of patients who had applied to the COMPRU treatment program. Patients were considered for treatment based on an protocol established by the members of the COMPRU team (See Appendix E). Because of the specialized nature of the subject population and the limited number of patients at the time of testing, selection was not randomized and no formal control group was established.

The first part of the present study, (description of a population and comparisons to the BPI norms), involved patients who were initially considered for one of several treatment programs offered at COMPRU. This initial population included patients that later completed treatment, declined treatment, or were referred to an alternative form of treatment. Of the 60 patients seen at the University of Alberta Education Clinic, 46 of them completed the questionnaires correctly and had demographic characteristics consistent with the normative comparison group. The data from nine of the patients was not included in this study because these patients were younger than the group used in norming the BPI clinical instrument. Two of the older patients had difficulty completing the questionnaires without the interpretive help of a second party and therefore the results were not used. Three of the subjects' results were rejected due to incorrect completion of the instruments. The remaining group consisted of 24 males (52.2 %) and 22 females (47.8 %). The mean age of this sample was 38.8 years (SD = 17.2) with a range from 14.2 to 73.2 years. Table 3.1 illustrates demographic characteristics of the initial patient sample.

TABLE 3.1

Demographic Characteristics of Initial Study Sample (n = 46)

CHARACTERISTIC	FREQUENCY	PERCENTAGE
GENDER		
Male	24	52.2
Female	22	47.8
AGE (YEARS)		
11-18	5	10.9
19-26	9	19.6
27-34	8	17.4
35-42	7	15.2
43-50	6	13.0
51-58	4	8.7
59-66	3	6.5
67-74	4	8.7
MARITAL STATUS		
Married	21	45.6
Single	18	39.1
Divorced	6	13.0
Widow/er	0	0.0
Cohabiting	1	2.2
WORK STATUS		
Student	12	26.1
Housewife	3	6.5
Working	21	45.6
Sick-listed	2	4.3
Sickness Pension	3	6.5
Retired	5	10.9

The types of injuries and etiologies varied within the patient population. The defects included: congenital microtia, traumatic accidents (e.g., motor vehicle accidents, burns, etc.), malignant cancers, and bone based hearing loss. The patients were then categorized into four etiological groups: Congenital, Neoplasia, Trauma, and BAHA (hearing loss). The patients involved in this study were also categorized by four treatment types:

1) Craniofacial Osseointegration - Extraoral; 2) Craniofacial Osseointegration - Intraoral; 3) Autogenous Reconstruction, (AR); and 4) Bone-Anchored Hearing Aid, (BAHA).

TABLE 3.2

Diagnostic Characteristics of Initial Patient Population

CHARACTERISTIC	FREQUENCY	PERCENTAGE
ETIOLOGY		
Congenital	14	30.4
Neoplastic	12	26.1
Traumatic	14	30.4
BAHA	6	13.1
TREATMENT		
Extraoral	29	63.0
Intraoral	5	10.8
AR	6	13.1
BAHA	6	13.1

The remaining groups were divided into nine categories based on etiology and treatment programs. Because the BAHA group was unique it was not subdivided into etiological categories. As can be seen in Table 3.3 the majority of the patients in this study were Extraoral Craniofacial patients with varied etiologies and were treated using osseointegrated prosthetics.

TABLE 3.3

Pre-Treatment Patients Grouped by Etiology and Treatment

Etiology	Autogenous Reconstruction	Extraoral Prosthetic	Intraoral Prosthetic
Congenital	2	10	2
Neoplastic	0	9	3
Traumatic	4	10	0

Pre-Post Operative Sample

At the time this data was compiled 18 of the 29 original extraoral craniofacial patients had completed the osseointegrated prosthetic surgical treatment. From this group 15 patients were able to complete the post-operative psychological measures. Four of these patients completed the questionnaires at the University of Alberta Education Clinic shortly after the final stages of their treatment at COMPRU. The remaining patients were contacted in June 1994 and were either scheduled to complete the questionnaires in the offices at COMPRU or (for the out-of-province patients) were asked to complete and return a mailed set of questionnaires. Three patients were unable to complete the post-operative questionnaires; one patient expired, another was in hospital due to an unrelated injury, and the third was unable to be contacted. The remaining group consisted of 9 males (60 %) and 6 females (40%). The mean age of this sample was 31.8 years (SD = 7.5) with a range from 18.6 to 44.2 years. Table 3.4 illustrates the demographic characteristics of the Pre-Post Operative sample.

TABLE 3.4

Demographic Characteristics of Pre-Post Operative Study Sample.

CHARACTERISTIC	FREQUENCY	PERCENTAGE
GENDER		
Male	9	60.0
Female	6	40.0
MARITAL STATUS		
Married	8	53.3
Single	7	46.7
WORK STATUS		
Student	6	40.0
Housewife	1	6.7
Working	8	53.3
ETIOLOGY		
Congenital	4	26.7
Neoplastic	2	13.3
Traumatic	9	60.0

This study was conducted over a wide time frame and the periods between rehabilitative stages and completion of questionnaires were not controlled. The time between completing the pre-operational and the post-operational measures varied, as did the time between pre-operational measures and final stage of prosthesis fitting. The average time period between measures was 2.34 years (SD = 1.5; range: 0. 71 to 4.69). Further there was temporal variation in the period in which each patient had lived with his or her prosthesis. The average time between the pre-operative measures and the prosthesis fitting was 0.87 years (SD = 0.5; range: 0.27 to 2.4). The average time between prosthesis fitting and the post-operative testing was 1.47 years (SD = 1.4; range: 0.11 to 3.8).

Procedure

As part of the ongoing treatment process, each patient considered for the COMPRU program was referred to the Education Clinic at the University of Alberta to complete a battery of psychological instruments. This procedure was presented to the patients as an exercise to help the team assist in the recovery process. The patients were also told that their participation in the program was not necessarily contingent on their performance on the questionnaires. Over a four and a half year period (from Oct. 25, 1989 to April 25, 1994) 60 candidates completed the battery. The questionnaires were administered individually by one of three researchers at the University Clinic with the majority administered by the current author.

From the original population 18 patients who underwent rehabilitative care for extraoral craniofacial defects were asked to complete a second set of the questionnaires (post-operative). Four of the patients completed the questionnaires at the University Education Clinic at various times during the 4 1/2 year period. In July 1994, 11 more patients were contacted and asked to complete a second, identical battery of tests. Of this group, seven completed the package of questionnaires (see Appendix B) in the offices at COMPRU and four were sent the package with a letter (see Appendix C). These patients

were also given the opportunity to share aspects of their rehabilitative experience with an open-ended questionnaire supplied at the end of this package (see Appendix D).

Questionnaires Administered

As part of the COMPRU pre-treatment protocol each patient was asked to complete a package of six questionnaires (or psychometric inventories). For the second portion of this study a subgroup of patients who had completed treatment, and were living with their prosthesis were contacted and asked to complete a second package of questionnaires. The package included: a demographic questionnaire (Appendix A); the Self-Efficacy Measure; Wallston's Health Locus of Control; Campbell's Sense of Well-Being Scale; the Sickness Impact Profile; and the Basic Personality Inventory. It was the intention of the current study to analyze clinical aspects of the patients' psychological and psychosocial well-being. To this end, the results of the Basic Personality Inventory (BPI) and the Sense of Well-Being scale were statistically analyzed.

Demographic Questionnaire

During the initial contact patients completed a demographic questionnaire (Appendix A). Information was obtained concerning the following: current date, date of birth, occupation, marital status, work status, address, and telephone numbers.

The Campbell Well-Being Scale

The Campbell Well-Being Scale is a nine item instrument rating various dimensions of happiness on 7-point semantic differential rating scales (Campbell, 1976).

The Basic Personality Inventory

The Basic Personality Inventory (BPI) is a 240-item, true-false questionnaire that includes 12 scales, each with 20 uniquely keyed true-false items (Jackson, 1989). As a bipolar scale this instrument has been used to characterize individuals as both high scoring or low scoring on the 12 scales. Of the 12 scales 11 were designed to measure elements of psychological disturbance. The twelfth scale, Deviation (Dev), was designed as a validity scale composed of critical items sensitive to infrequent and erratic responses. The remaining scales measure a number of psychological characteristics: Hypochondriasis, (Hyp); Depression, (Dep); Denial, (Den); Interpersonal Problems, (IPs); Alienation, (Aln); Persecutory Ideas, (PId); Anxiety, (Anx); Thinking Disorder, (ThD); Impulse

Expression, (ImE); Social Introversion, (SoI); and Self Depreciation, (SDp) (Jackson, 1989).

The BPI is a psychometric tool designed as a clinical instrument to be used in screening and diagnosis. This instrument was partially modeled after the Minnesota Multiphasic Personality Inventory (MMPI) and designed to detect many of the same dimensions of psychopathology. The BPI is considered to be psychometrically superior to the MMPI; easier to administer, contains more homogenous scales, and has a psychiatric predictability factor as good or better than the MMPI (Retzlaff & Bromley, 1991). The independent scales have each been established as internally consistent and has valid measures; with reliability scores ranging from .68 to .87. High measures of discrimination validity have been established by way of independent studies using clinical and normal populations and through comparisons with other well established measures (e.g., Beck's Depression Inventory, State-Trait Anxiety Inventory and the MMPI).

As mentioned, the BPI has built-in measures to help detect invalid or purposefully distorted results. In a case where a person is trying to make himself appear in a positive light (faking good) the BPI profile is characterized by a high score (T score above 70) on the Denial scale and low scores on all other scales. In the case where a person is trying to accentuated the dire nature of his/her situation the BPI profile is characterized by high scores on all scales (especially Deviation) and a lower score on the Denial scale.

Methodological Assumptions

Due to limitations in the ability to control many elements of this study, several assumptions must be made and acknowledged before proceeding with the analysis of the results. Firstly, we assume that the samples we have obtained are representative of their respective groups. Secondly, the BPI conversion tables used to calculate T scores for our samples were constructed using a wide normative sample. In using the "normal" tables we are making the assumption that the patient population in this study is represented by the normative population. Thirdly, for the initial study we have combined the sample with respect to treatment types. That is, the pre-treatment group is categorized into extraoral osseointegrated prosthetics, intraoral osseointegrated prosthetics, and autogenous reconstruction. Because of the small numbers of the latter two subgroups we have not

partitioned the patient population on this variable. The assumption is that patients in these treatment groups do not differ from one another in any manner that would affect the focus of our study. Fourthly, we are making an assumption of the relative stability of the constructs we are measuring. This is especially important given that we did not control for time periods between completion of questionnaires relative to surgery dates and in the traumatic and neoplastic groups relative to disfigurement.

Hypotheses

The study was conducted to investigate the following statistical hypotheses:

Ho 1.1: In the pre-operational sample, scores on the BPI scales will reflect measures in the normal range of scores.

Ho 2.1: There will be no significant between group differences for any of the psychometric scales of the BPI.

Ho 2.2: There will be no significant between group differences for measures of Inadequate Impulse Control (ImE, IPs, Anx, Aln, Den).

Ho 2.3: There will be no significant between group differences for measures of General Social Anxiety (Anx).

Ho 2.4: There will be no significant between group differences for measures of Depression and Somatization (Hyp, Dep).

Ho 2.5: There will be no significant between group differences for measures of Psychotic Processes (PId, ThD, Aln, Dev).

Ho 2.6: There will be no significant between group differences for measures of Depressed Withdrawal (SoI, SDp, Dep, Aln).

Ho 3.1: There will be no differences between etiological groups on measures of happiness or well-being.

Ho 4.1: Post-operative measures of mood and personal/emotional adjustment (Dep, Anx, Hyp), and in areas of self-perception and sociability (SDp, SoI) and interpersonal problems will not show any decreases from pre-operative measures ($\mu_1 \leq \mu_2$).

Ho 4.2: Post-operative measures of patient happiness, or well-being, will not show any decreases from pre-operative measures ($\mu_1 \leq \mu_2$).

Data Analyses

After the completed questionnaires were collected, the BPI and the Campbell Scale of Well-Being were scored by hand and the results entered into a database. After all the data was entered it was cleaned by randomly selecting a sample of 15% of the original population. These numbers were then re-checked against the original records. The results of this exercise indicated only one mistake in a possible 15,661 data entry and conversion points. The BPI scores were then converted to T-scores based on age-based norms (Jackson, 1989). Statistical analysis was then performed on the data. One-way ANOVA was conducted for between etiological groups with age differences, Campbell's measures of well-being and BPI scales. For the post-treatment study T-test analysis was performed for the repeated measures design.

Chapter 4

Results

The findings of the empirical data analyses are presented in this chapter. The intent of the analyses was twofold: 1) to describe the pre-operative patient population in terms of clinical variables (overall and in etiological groups), and 2) to measure changes in clinical variables after treatment.

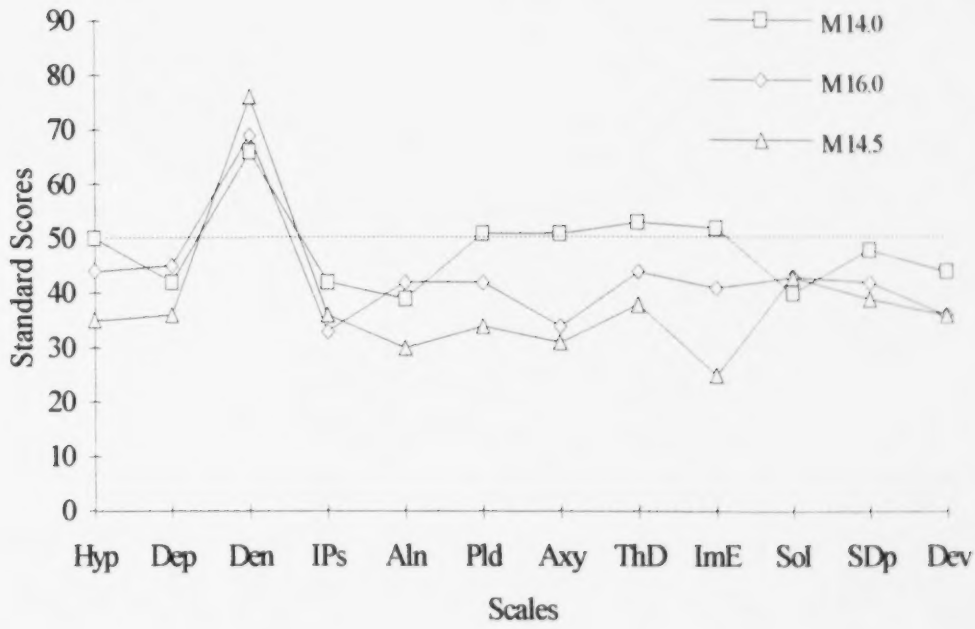
Pre-Treatment Population

Screening for Distorted and Invalid BPI Profiles

After conversion to standard T scores, the profiles of individuals were analyzed for characteristic distortions. Research in the development of this scale notes that a high score on Denial scale, coupled with low scores in all other scales, serves as a marker for "faking good adjustment" and identifies invalid scale profiles (Jackson, 1989). This research indicated that these individuals are "fairly defensive, may deny normal affective responses and tends to repress unpleasant or emotionally charged cognitions" (p. 21). In our population five individuals scored one standard deviation above the mean (or higher) on the Denial scale. Of this group three individuals' profile were characterized by a Denial scale score of at least one standard deviation above the mean and low to average scores on all other scales. These profiles where also characterized by differences between the Denial scale score and other scale scores of at least one standard deviation. Figure 4.1 illustrates these three profiles.

FIGURE 4.1

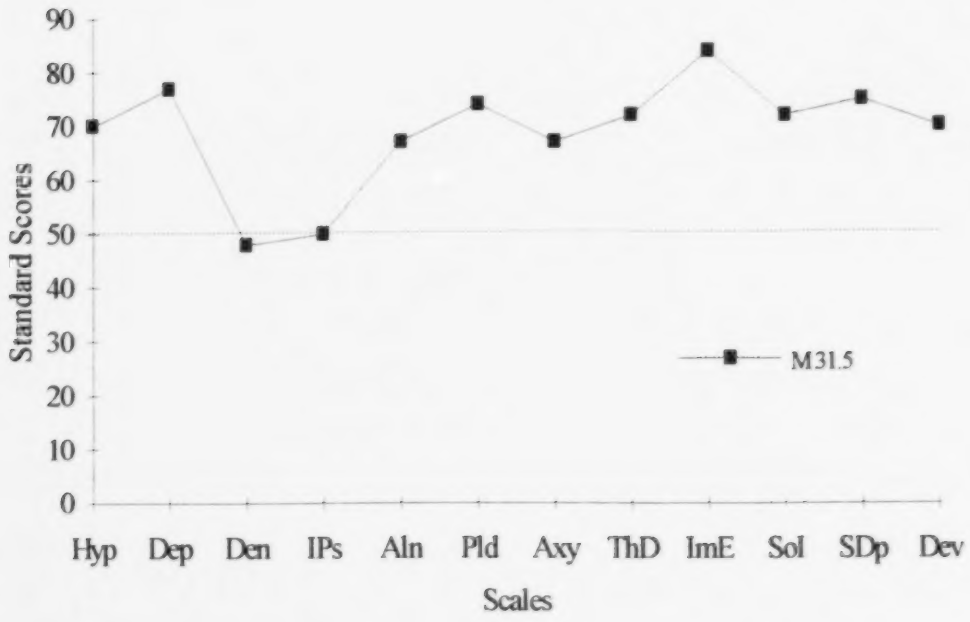
BPI Profiles Indicating Suspicion of "Faking Good"



Jackson (1989) also cautioned about BPI profiles characteristic of individuals "faking maladjustment." Research in the development of the BPI indicated that distortion in profiles characterized by low Denial scale scores and above average scores on all other scales. This profile was found in the results of one of our patient's questionnaires and was therefore considered invalid (as illustrated in Figure 4.2).

FIGURE 4.2

BPI Profile Indicating Suspicion of "Fake Maladjustment"



BPI Scale Scores For Pre-Treatment Group (n = 42)

Hypothesis 1.1

Ho 1.1: In the pre-operational sample, scores on the BPI scales will reflect measures in the normal range of scores.

Table 4.1 illustrates BPI mean scores on the psychological variables for the remaining 42 patients. These results indicate mean scores within an average range for the majority of the BPI subscales. However, measures of Depression, Social Introversion, Persecutory Ideation, and Self Depreciation appear to be slightly higher when compared with normative mean scores and measures of variability (M = 50, SD = 10).

Another method by which to present the BPI scale information for this group is to count the number of individuals that scored significantly above or significantly below the average range of scores in each scale. This data is also presented in Table 4.1. The differences are immediately apparent for the Social Introversion, Self Depreciation, Depression and Denial scales. On the Social Introversion scale and on the Self Depreciation scale 11 individuals and 10 individuals, respectively, scored at least one standard above the mean.

TABLE 4.1

Means, Standard Deviations, and Ranges of

BPI Standard Scores for Pre-Operative Group (n = 42)

SCALES	MEAN	SD	RANGE	ABOVE 1 SD	BELOW 1 SD
Hypochondriasis	50.3	8.0	36 - 68	5	5
Depression	52.5	12.0	39 - 97	9	4
Denial	50.6	7.7	32 - 63	8	3
Interpersonal Problems	48.3	8.3	31 - 68	3	5
Alienation	49.0	9.8	33 - 76	6	6
Persecutory Ideation	52.3	10.0	35 - 78	8	4
Anxiety	50.1	9.9	33 - 71	7	9
Thinking Disorder	50.3	10.2	39 - 83	6	5
Impulse Expression	49.9	10.5	33 - 81	8	6
Social Introversion	54.1	12.8	39 - 89	11	1
Self Depreciation	54.2	13.0	41-103	10	0
Deviation	50.6	9.3	40 - 75	8	4

note: n = 42

Analysis of Variable Differences Between Pre-Treatment Groups

Assumptions of Inter-Group Demographic Homogeneity

After screening for invalid profiles the remaining sample is categorized based on etiological groupings (Congenital, Neoplastic, Traumatic, and BAHA). An assumption must be made that these groups do not differ in any demographic characteristic that would account for elevated (or depressed) scores on any of the BPI scales. Of primary concern were the following variables; age and gender. Table 4.2 illustrates these demographic characteristics for the four etiological groups.

TABLE 4.2

Demographic Characteristics of Pre-Operational

Sample by Groups

	GENDER		AGE		
	MALES	FEMALES	MEAN	SD	RANGE
Congenital	5	7	32.2	12.9	14.5 - 52.7
Neoplastic	6	6	51.6	18.8	19.2 - 73.2
Traumatic	6	6	32.4	8.2	20.5 - 49.4
BAHA	3	3	52.1	14.2	27.3 - 69.3

Although the groups are balanced by gender, the variable age differs between groups. Figure 4.3 illustrates the one-way ANOVA results of age distribution within and between groups. As these results indicate, the differences are significant

FIGURE 4.3

Differences of Age Between Etiological Groups

GROUPS	SOURCE OF VARIATION	DF	MEAN SQUARE	F	P
Congenital	Between Groups	3	1303.74	6.637	0.001
Neoplastic	Within Groups	38	196.42		
Traumatic					
BAHA	Total	41			

Hypothesis 2.1

Ho 2.1: There will be no significant between group differences for any of the psychometric scales of the BPI.

The results of the one-way ANOVA indicated significant between group differences ($p < 0.05$) for the following BPI scales: Interpersonal Problems, Alienation, Persecutory Ideation, Impulsive Expression, and Deviation. The between group differences for the mean scores on the Alienation scale also approached significance ($p = 0.085$). Therefore, hypothesis 2.1 is rejected. Table 4.3 illustrates the means, standard deviations, and the levels of significance for the 12 scales.

TABLE 4.3

Between Etiological Group Differences in BPI Scale Scores

SCALE	CONGENITAL (n= 12)	NEOPLASTIC (n= 12)	TRAUMATIC (n= 12)	BAHA (n= 6)	P
Hyp	51.3 (8.9)	51.3 (8.8)	50.0 (7.4)	46.7 (6.2)	0.663
Dep	55.7 (17.5)	51.5 (11.6)	52.6 (7.1)	47.8 (7.7)	0.628
Den	47.7 (10.0)	52.8 (6.3)	49.1 (6.3)	55.0 (5.9)	0.168
IPs	50.8 (7.4)	44.1 (7.2)	52.3 (7.3)	43.8 (9.9)	0.029**
Aln	54.4 (10.4)	45.8 (9.2)	45.8 (6.2)	51.2 (12.6)	0.085*
PId	57.7 (7.9)	51.8 (7.8)	46.4 (6.6)	54.2 (17.0)	0.040**
Anx	55.7 (8.0)	51.3 (11.1)	46.4 (9.5)	43.8 (6.4)	0.040**
ThD	51.8 (8.8)	50.9 (9.7)	45.3 (5.2)	56.3 (17.8)	0.157
ImE	55.7 (8.9)	44.3 (8.1)	51.5 (12.0)	46.5 (9.6)	0.039**
SoI	53.7 (14.7)	56.1 (15.3)	51.3 (10.7)	56.7 (7.9)	0.788
SDp	54.5 (18.3)	57.6 (14.4)	50.3 (5.8)	54.8 (7.1)	0.600
Dev	57.3 (11.0)	46.3 (7.4)	50.8 (7.3)	45.5 (4.7)	0.008**

(Note: Standard Deviations are in parenthesis) * $p < 0.10$; ** $p < 0.05$

The congenital group had the highest average scores for the following scales; Aln, PId, Anx, ImE, and Dev. This group also had the second highest average for the scale measuring interpersonal problems (IPs). The traumatic group had the highest score for the IPs scale. The BAHA group had the lowest average score in the IPs, Anx, and Dev scales. The traumatic group had the lowest average score on both the Aln and PId scales. The neoplastic group had the lowest average score in the ImE scale and shared the lowest score on the Aln scale.

Hypothesis 2.2-2.6

Ho 2.2: There will be no significant between group differences for measures of Inadequate Impulse Control (ImE, IPs, Anx, Aln, Den).

Ho 2.3: There will be no significant between group differences for measures of General Social Anxiety (Anx).

Ho 2.4: There will be no significant between group differences for measures of Depression and Somatization (Hyp, Dep).

Ho 2.5: There will be no significant between group differences for measures of Psychotic Processes (PId, ThD, Aln, Dev).

Ho 2.6: There will be no significant between group differences for measures of Depressed Withdrawal (Sol, SDp, Dep, Aln).

As indicated in Table 4.3 the between group differences varied between scales with six of the twelve scales showing significant results. By strict standards we must accept hypotheses 2.2, 2.4, 2.5, and 2.6 for no one group consistently scored highest on all the scales making up these factors. Of these six scales that did show significant between group differences four were found in the factor labeled Inadequate Impulse Control: ImE, IPs, Anx, and Aln. The congenital group has the highest mean scores for three of these four scales (ImE, Anx, Aln) and the second highest for the fourth scale (IPs).

Three of the four scales that constitute the factor Psychotic Process showed significant between group means. For all three of these scale the congenital group showed

showed the highest mean score. For the fourth scale in this factor, ThD, the congenital group had the second highest score.

The factor General Social Anxiety is based on the measurement of one scale; Anxiety. Our study results indicated a significant between group differences. Therefore, hypothesis 2.3 was rejected. The highest mean score in this factor was in the Congenital group, followed by the Neoplastic, Traumatic, and BAHA group, respectively.

Hypothesis 3.1

Ho 3.1: There will be no differences between etiological groups on measures of happiness or well-being.

Results of one-way ANOVA for individual items of the Campbell Scale of Well-Being indicated significant differences between groups in two cases. On the item in which subjects were asked to rate aspects of their present life on a seven point scale between two extremes: "life doesn't gives me a chance" and "brings out the best in me." Significant differences ($p = 0.017$) were found between groups with the BAHA group rating the highest and the Congenital group rating the lowest.

FIGURE 4.4

Between Group Differences on the 'Optimism' Item on Happiness Scale

GROUPS	AVERAGE	VARIANCE
Congenital	4.50	1.000
Neoplastic	5.08	1.356
Traumatic	5.17	1.424
BAHA	6.33	0.667

Results in the 'life as a whole' item also showed significant differences ($p = 0.19$) between groups. This is the last item on the questionnaire and asks the subject to rate how satisfied he or she is with life as a whole. The extremes on this item are completely dissatisfied to completely satisfied. Again the highest overall rating on this item was

displayed in the BAHA group and the lowest was in the Congenital group. All other items on this scale did not show significant differences.

FIGURE 4.5

Between Group Differences on the 'Life as a Whole' Item of the Well-Being Scale

GROUPS	AVERAGE	VARIANCE
Congenital	4.00	2.545
Neoplastic	5.25	1.114
Traumatic	4.75	0.568
BAHA	5.67	0.667

Pre-Post Treatment Study

BPI Scale Scores For Post-Treatment Group (n = 15)

Hypothesis 4.1

Ho 4.1: Post-operative measures of mood and personal emotional adjustment (Dep, Anx, Hyp), and in areas of self-perception and sociability (SDp, SoI) and interpersonal problems will not show any decreases from pre-operative measures ($\mu_1 \leq \mu_2$).

Paired t-test analysis was performed on Pre-test \ Post-test measures of the BPI scales. Using a 0.05 level of significant (one-tail test) hypothesis 4.1 was accepted. However as table 4.7 illustrates several of the measures for both personal and social adjustment show a reduction in average scores and a trend toward significance. These included measures of emotional adjustment: Depression and Anxiety. These also included measures of sociability: Self Depreciation. A reduction in average scores was also found in the measure of Denial.

TABLE 4.7

Pre-Test \ Post-Test Means and Significance of Differences

Scale	Pre-Test	Post-Test	p
Hyp	49.3	51.5	0.09
Dep	54.9	51.5	0.06
Den	51.4	47.9	0.08
IPs	52.7	51.3	0.27
Aln	47.7	47.2	0.39
PId	50.1	47.3	0.12
Axy	50.3	45.9	0.07
Thd	47.9	46.8	0.28
ImE	51.1	52.0	0.39
SoI	52.0	52.3	0.44
SDp	51.6	49.7	0.09
Dev	52.4	51.1	0.17

Hypothesis 4.2

Ho 4.2: Post-operative measures of patient happiness, or well-being, will not show any increases from pre-operative measures ($\mu_1 \geq \mu_2$).

Paired t-test analysis was performed on Pre-test \ Post-test measures of the items found within the Campbell Scale of Well-Being scales. Using a 0.05 level of significant (one-tail test) hypothesis 4.2 was rejected. The patients in this sample rated their lives as being more interesting, worthwhile, friendly, full, and rewarding. On an item framed by "doesn't give me a chance" and "Brings out the best in me" the patients rated closed to the more optimistic outlook. These patients also indicated that, overall, they were more satisfied with their life.

TABLE 4.8

Campbell Well-Being Scale Pre-Test \ Post-Test Ratings

Items	Pre-Test	Post-Test	p
Boring-Interesting	4.80	5.47	0.002
Miserable-Enjoyable	5.33	5.47	0.368
Useless-Worthwhile	5.47	6.20	0.011
Lonely-Friendly	5.33	6.00	0.028
Empty-Full	5.13	5.67	0.036
Discouraging-Hopeful	5.60	5.73	0.368
Disappointing-Rewarding	4.93	6.00	0.002
Doesn't give me a chance-Brings out the best in me	4.87	5.87	0.011
Dissatisfied-Satisfied	4.53	5.33	0.011

Chapter 5

Summary and Discussion

This study examined psychological dimensions of a sample of craniofacially deformed patients as measured by the Basic Personality Inventory and the Campbell Scale of Well-Being. This chapter includes a discussion of this study's findings in relation to the literature reviewed earlier and also a discussion of the implications of these findings. The chapter is organized into the following three sections: summary of the results found in the current study; conclusions of the study; and, implications for further research.

Summary

Although attempting to build on past research and address the problems cited in samples of previous studies, there are several aspects of this study that suffer from the same methodological weaknesses criticized by several authors. Despite these limitations, the findings of this study support several of the theoretical notions and extant research findings.

Our initial profile analysis of the sample revealed three scores that demonstrated characteristics consistent with motivated distortion of results. It is interesting to note that the three individuals, judged to be "faking good", were all young adolescent males (14 to 16 years) and the three youngest males in our sample. Keeping in mind that all BPI results were converted to T scores based on norm scores and that these three were converted based on adolescent norms (between 12 and 18 inclusively). It therefore appears that a characteristic of the young men in this population is towards anxious and defensive responding while denying their true feelings. Jackson (1989) suggested that individuals with this pattern of scores deal with stress through active flight or avoidance. Although some parents may argue that this is characteristic of young adolescent boys in general, these scores were derived by comparison to their gender and age peers. Therefore, even if this is a characteristic of the age and gender these three individuals appear to be into denial even more than their peers,

In our general pre-treatment sample the averages for scores on all BPI scales fell within the normal range of scores. Although some of the averages were slightly higher than normative measures scores, (most notably for Social Introversion and Self Depreciation), the standard deviations for these measures were also larger and the averages did fall within the normal range. These results appear to indicate that the COMPRU sample, as a whole, does not appear to differ from normal populations on any psychological (emotional or psychotic) dimension measured by the BPI. This finding does not support Pertschuk and Whitaker's (1987) general finding of "obvious disturbances" in social adjustment, self-concept, depression, and anxiety in adolescent and adult populations. However, despite this general finding there appears to be more than one way to look at our data. Because the BPI is a clinical instrument, each case is usually analyzed as a profile of scale scores. Concerns for specific characteristics are then derived from deviations from the normative sample on individual scales. Like the findings of Pertschuk and Whitaker (1987) our present population exhibited considerable variation within the population on psychological dimension. Moreover, 30 percent of our patient sample (13 of 42) demonstrated abnormal scores (above two standard deviations) on one or more scales. Further, 69 percent of the patient sample had scores above one standard deviation for one or more of the scales. Our results indicated that measures of depression, persecutory ideation, self depreciation, and social introversion contained the most subjects with abnormally high scores. In sum, although our pre-treatment population appeared to demonstrate a normal distribution of scores for the BPI scales, a review of profile scores suggests that a portion of the patient population is experiencing psychological distress. The areas of concern were consistent with previous studies for depression (Deaton and Langman, 1986; Napoleon, 1993; Pruzinsky, 1992; Ward, Moss & Darko, 1987) self perception and social difficulties (Blomberg & Lindquist, 1983; Jensen, 1978; Pertschuk & Whitaker, 1987:1988).

Significant between group differences were found in scales that are factored into the following categories: Inadequate Impulse Control, General Social Anxiety, Thinking Disorder, and Depressed Withdrawal. On individual scales, several of the measures that

were found to have higher scores in the general sample did not show significant between groups differences. Conversely, other scales did not show higher scores in the general population yet had significant between group differences. In the former case this appears to the result of general high scores for all groups (i.e., measures of social introversion, self depreciation, and depression). In the case of significant between group differences it appears that high scores in some groups were offset by lower scores in other groups (e.g., interpersonal problems, anxiety, impulse expression, and deviation). As a result, when compared to the overall patient sample, higher average scores were found when analyzing scale scores by groups. These results suggest that the origin of the deformity has an influence on the psychological disposition of the patient population.

Between group differences in mean scores identified the congenital group as having the highest scores in several areas, including; alienation, anxiety, persecutory ideation, impulse expression, and deviation. The lowest scorers vary between groups on the individual scales and do not appear to be consistent with the categories. For example, in the category measuring Inadequate Impulse Control the congenital group obtained highest average scores on the scales; Alienation, Anxiety, and Impulse Expression. However, for the remaining two scales this group obtained the second highest inter-group score on Interpersonal Problems and the lowest inter-group score on Denial. As may be expected from the trends in the BPI subscale scores, measurements of life-satisfaction, individuals in the BAHA group responded with overall higher scores than the congenital group.

Again caution is noted in the generalization of these results. Specifically, this is because: 1) the significance reported in the between group analysis is between group scores and not necessarily between group scores and the normative average; 2) we know that the groups differ significantly in their age distributions, however we don't know the effect that age has on the measures.

Before discussing the results of the pre-test post-test study further, it may be helpful to qualify the patient sample. The 15 patient post-operative sample was drawn from various etiological backgrounds. Although all were treated with osseointegration based

anchors for extraoral prostheses, nine of these patients had injuries as the result of trauma, four were from congenital defects, and two were from loss due to cancer. The age range of this group was also specific (between 14 and 44).

In the pre-test / post-test study, trends toward positive changes were noted for some of the psychological dimensions measured. Specifically, indicators of mood and self perception (depression, anxiety, and self depreciation) all showed trends toward further stability. This trend is consistent with much of the literature (Blomberg, 1985; Deaton and Langman, 1986; Jensen, 1978; Kent, 1992; Napoleon, 1993).

The Denial subscale also showed a decrease in average score. This may indicate that individuals were calmer and less defensive during the second battery of questionnaires. We may rule out general motivated distortion in these scores (as the denial score often indicates) in light of the fact that in individual profile analysis positive distortion is reflected by high denial scores and comparably lower scores on other scales. If the patients had a tendency toward making themselves look good in the pre-test and answering more "honestly" in the second test this might be reflected by lower pre-test scores and higher post-test scores on all other variables. Therefore, because the scale scores were lower in the post-test measures for depression, anxiety, and self depreciation, they are probably accurate reflections of change.

Contrary to other measures of mood and emotional adjustment there was an average overall increase in scores on the hypochondriasis measure. This may be understandable when keeping in mind that this measure, used in patient populations, more often reflects true somatic complaints and not an unjustified over-concern for one's health. Given this, and the fact that our study didn't control for time periods it is difficult to distinguish whether the patients' elevated hypochondriacal score was physically justified.

Also, consistent with previous literature commenting on the psychological benefits of osseointegrated implants in prosthetic surgery (Blomberg, 1985; 1991; Kent & Johns, 1991; 1994), this population appeared to rate their overall life-satisfaction (well-being) higher after treatment. However, despite the desire to hear "happy ever after" endings, from an objective researchers point of view one must keep in mind Festinger's Cognitive

Dissonance theory to explain changes in happiness (Festinger, 1968). It may be that when considering their lives after treatment, the patients were inclined to answer more positively to justify the expense (pain, finances and effort) of treatment in their own minds.

Conclusions

In rehabilitative surgery for congenitally deformed individuals the motivation for surgery is to obtain some semblance of normalcy and to avoid stigmatisation. In cases of traumatic injury the motivation is often to return to an image as close as possible to the one the person had prior to insult. With congenital craniofacial deformities, concomitant anomalies often compound the stressors with which a child must cope. For a portion of the population of trauma victims, premorbid psychological difficulties existed and for some were instrumental in the accident. Within the oncological population, issues of the disease often outweigh the concern for aesthetic rehabilitation. It is partially because of these differences that the study of psychosocial aspects of rehabilitation is diverse. However, it is from this diversity that we can begin to understand some of the intricacies of the interrelationships involved.

If the developmental and psychosocial effects of craniofacial defects are consistent with the *attribution-based model* postulated by Crocker and Major (1989) then we would expect that the congenital population will be better adapted to their condition than the other two groups. The development of the individual's psychological and psychosocial characteristics might then be based on other personal and social criteria.

If they are the least stable of the groups in measures of psychosocial dimensions then we may suspect that the attractiveness theory or *reflected appraisal* theory is more true. Psychological dimensions would be affected in accordance with the idea that elements of social and psychological health are established during early childhood (Bowlby, as cited in Kent & Johns, 1991). The congenitally craniofacially deformed would then pass through this period with a visible stigma. Also having lived longer with the stigma, as we assume an adult sample of this group would, the negative influences of the stigma would be more pronounced than in a traumatic or disease based group (Pertschuk and Whitaker, 1987).

The current study appears to support the latter theoretical position; that is measures of psychological and psychosocial distress appear to be more prominent in the congenital group.

Having found this distinction in measures of anxiety and psychosocial distress between groups, and because a higher incidence of post-surgical complications may occur in patients with higher distress levels, (Kiyak, Vitano, & Crinean, 1988; Pertschuk & Whitaker, 1987; 1988) it follows that members of the rehabilitative team should be especially sensitive to problems in the congenital group.

Overall, the results of the pre-post treatment study lend support to the hypothesis that positive changes occur in emotional and self perceptual measures. However, due to many factors involved in this study such a statement must be made with some reservation. For instance, our pre-test post-test sample consisted primarily of trauma patients and our pre-treatment study revealed higher scores on psychosocial measures in the congenital group than in the traumatic group. Furthermore, because we did not include the incident dates for these trauma patients' injuries, any transitional, adaptive, post-traumatic difficulties experienced by trauma patients in general, were not be identified and accounted for in the analysis. In sum, although our results are consistent with previous findings, conclusions should be made with reservation until the results of a larger sample (with several individuals representative of each of the etiological groups) can be analyzed.

Recommendations

It appears that only a small percentage of the general patient population that is referred to COMPRU has any symptoms of serious psychological disturbance. As pointed out in previous literature (Blomberg, 1991), perhaps screening the whole population using a generalized clinical instrument is not necessary. It may be justified in a small percentage of the population and other researchers have suggested (Pertschuk & Whitaker, 1987) that members of the rehabilitative team should be able to identify these cases and then initiate appropriate testing or clinical assessment. For the general patient population, it may be more efficient to using more specific instruments to measure the

areas of concern. Other instruments used for research in this area include: for depression, Beck's Depression Inventory (BDI); for Alcoholism and Drug Abuse, the Brief Michigan Alcohol Screening Test (BMAST) or the Drug-Abuse and Alcohol Screening Test (DAST); for relative health, the General Health Questionnaire (GHQ). For general purposes, the Basic Personality Inventory functions both to screen for serious psychopathological symptomology and to measure levels of psychological dimensions such as depression, anxiety and interpersonal problems.

Perhaps the most obvious recommendation in further research is to address the methodological concerns of the current study. This would include: more stringent research design, a larger sample size, and a comparison control group. The timing of instrument administration also needs to be standardized with equal periods between each critical event. Results of past research suggests that the first screening interview, or initial questionnaire administration, should be completed with the first two weeks of trauma or diagnosis of disease. Also, in any research investigation the interval between trauma and interview should be the same (Shepherd, 1992).

In future research a larger sample would help facilitate the identification of characteristics unique to each subgroup (congenital, traumatic, oncological, BAHA). Perhaps in one way our differing populations could act as comparison groups for one another. For example, we might compare the BAHA group results to those of the facially disfigured group; although the diversity of these groups may outweigh any similarities and unduly complicate matters. We could then hypothesize that the BAHA group, (because these individuals don't suffer from the same aesthetic deformity), could act as a comparison group for those variables that are deemed more sensitive to appearance.

Future research could also compare groups of patients based on location of injury or defect. In other words, a comparison could be done between patients with intraoral injuries and patients with extraoral injuries. This comparison may show differences in psychological dimensions associated with attractiveness based on 'visibility' of the defect.

Overall, research on the psychological dimensions of this population will help to identify individuals at risk for difficulties during the rehabilitative process. Further

research will also help to develop and clarify the interrelationships between appearance and psychological health. This will help professionals in their development of programs that more effectively meet the needs of these patients.

References

Auerbach, S. M., Meredith, J., Alexander, J. M., Mercuri, L. G., & Brophy, C. (1984). Psychological factors in adjustment to orthognathic surgery. Journal of Oral Maxillofacial Surgery, 42, 435-440.

Bailey, L. W., & Edwards, D. (1975). Psychological considerations in maxillofacial prosthetics. Journal of Prosthetic Dentistry, 34, 533-538.

Bennett, M. E., & Stanton, M. L. (1993). Psychotherapy for persons with craniofacial deformities: can we treat without theory? Cleft Palate-Craniofacial Journal, 30, 406-410.

Blomberg, S. (1985). Psychological Response. In P-I. Brånemark, G. A. Zarb, and T. Albrektsson (Eds.), Tissue-Integrated Prosthesis. Osseointegration in Clinical Dentistry (pp. 165-174). Chicago, IL: Quintessence Publishing.

Blomberg, S. (1991). Psychological Aspects of Treatment Results and Patient Selection. In P. W. Worthington & P. Brånemark (Eds.), Advanced osseointegration surgery: Applications in the maxillofacial region (pp. 347-352). Chicago, Ill: Quintessence Publishing.

Blomberg, S., & Lindquist, L. W. (1983). Psychological reactions to edentulousness and treatment with jawbone-anchored bridges. Acta Psychiatry Scandinavia, 68, 251-262.

Bull, R. (1983). The general public's reactions to facial disfigurement. In P. P. Burfield (chair), Proceedings of the International Congress on Maxillofacial Prosthetics and Technology (pp. 450-453). Symposium conducted at the Royal College of Surgeons of England, Roehampton, England.

Bull, R., & Rumsey, N. (1988). The Social Psychology of Facial Appearance. New York: Springer-Verlag.

Cash, T. F., Gillen, P., & Burns, S. D. (1977). Sexism and beautyism in personnel consultant decision making. Journal of Applied Psychology, 62, 301

Campbell, A. (1976). Subjective measures of well-being. American Psychologist, 31, 117-124.

Crocker, J., & Major, B. (1989). Social stigmata and self-esteem: The self-protective properties of stigmata. Psychology Review, 96, 608-630.

Deaton, A. V., & Langman, M. I. (1986). The contribution of psychologists to the treatment of plastic surgery patients. Professional-Psychology-Research-and-Practice, 17(3), 179-184.

Dion, K. K., Berscheid, E., & Walster, E. (1972). What is beautiful is good? Journal of Personality and Social Psychology, 24, 285.

Eagly, A. H., Makhijani, M. G., Ashmore, R. D., & Longo, L.C. (1991). What is beautiful is good, but... A meta-analytic review on the physical attractiveness stereotype. Psychological Bulletin, 110, 109-128.

Festinger, L. (1968). A Theory of Cognitive Disonance. Stanford, CA: Stanford University Press.

Houston V., & Bull R. (1992). Children's reactions to faces before and after minor facial surgery. Journal of Social Psychology, 132, 557-559

Jackson, D. N. (1989). Basic Personality Inventory manual. London, Ontario: Sigma Assessment Systems.

Jensen, S. H. (1978) The psychosocial dimensions of oral and maxillofacial surgery: A critical review. Journal of Oral Surgery, 36, 447-453.

Kent, G. (1992). Effects of osseointegrated implants on psychological and social well-being: A literature review. The Journal of Prosthetic Dentistry, 68, 515-518.

Kent, G., & Johns, R. (1994). Effects of osseointegrated implants on psychological and social well-being: A comparison with replacement removable prosthesis. International Journal of Oral & Maxillofacial Implants, 9, 103-106.

Kent, G., & Johns, R. (1991). A controlled longitudinal study on the psychological effects of osseointegrated dental implants. International Journal of Oral & Maxillofacial Implants, 6, 470-474.

Kiyak, H. A., Beach, B. H., Worthington, P., Taylor, T., Bolender, C., & Evans, J. (1990). The psychological impact of osseointegrated dental implants. The International Journal of Oral & Maxillofacial Implants, 5, 61-69.

Kiyak, H. A., Hohl, T., West, R. A., & McNeill, R. W. (1984). Psychologic changes in orthognathic surgery patients: A 24-month follow up. Journal of Oral Maxillofacial Surgery, 42, 506-512.

Kiyak, H. A., Vitaliano, P. P., & Crinean, J. (1988). Patients' expectations as predictors of orthognathic surgery outcomes. Health Psychology, 7, 251-268.

Kiyak, H. A., West, R. A., Hohl, T., & McNeill, R. W. (1982). The psychological impact of orthographic surgery: A 9-month follow-up. American Journal of Orthodontics, 81, 404-412.

Langius, A., Bjorvell, H., & Lind, M. G. (1993). Oral- and pharyngeal-cancer patients' perceived symptoms and health. Cancer Nursing, 16, 214-221.

McComb, H. (1993). Osseointegrated titanium implants for the attachment of facial prostheses. Annals of Plastics Surgery, 31, 225-232.

McEleney, M. (1992). Facing facts. Nursing Times, 88, 56-58.

Macgregor, F. C. (1990) Facial disfigurement: Problems and management of social interaction and implications for mental health. Aesthetic Plastic Surgery, 14, 249-257.

McReynolds, P. (1989). Diagnosis and clinical assessment: Current status in major issues. Annual Review of Psychology, 40, 83-108.

Napoleon, A. (1993). The presentation of personalities in plastic surgery. Annals of Plastic Surgery, 31, 193-208.

Patzer, G. L. (1985). The Physical Attractiveness Phenomena. New York: Plenum.

Pertschuk , M. J., & Whitaker, L. A. (1987). Psychosocial considerations in craniofacial deformity. Clinics in Plastic Surgery, 14, 163-168.

Pertschuk, M. J., & Whitaker, L. A. (1988). Psychosocial outcome of craniofacial surgery in children. Plastic and Reconstructive Surgery, 82, 741-744.

Peterson, L. J., & Topazian, R. G. (1976). Psychological considerations in corrective maxillary and midfacial surgery. Journal of Oral Surgery, 34, 157-164.

Pruzinsky, T. (1992). Social and psychological effects of major craniofacial deformity. Cleft Palate-Craniofacial Journal, 29, 578-584.

Pruzinsky, T., Rice, L. D., Himel, H. N., Morgan, R. F., & Edlich, R. F. (1992). Psychometric assessment of psychologic factors influencing adult burn rehabilitation. Journal of Burn Care and Rehabilitation, 13, 79-88.

Retzlaff, P. D., & Bromley, S. (1991). A multi-test alcoholic taxonomy: Canonical coeffecient clusters. Journal of Clinical Psychology, 47, 299-309.

Sela, M., & Lowenthal, U. (1980). Therapeutic effects of maxillofacial prostheses. Oral Surgery, 50, 13-16.

Shepherd, J. P. (1992). Strategies for the study of long-term sequelae of oral and facial injuries. Journal of Oral Maxillofacial Surgery, 50, 390-399.

Shprintzen, R. J. (1991). Fallibility of clinical research. Cleft Palate-Craniofacial Journal, 28, 136-140.

Tobiasen, J. M. (1984). Psychosocial correlates of congenital facial clefts: A conceptualization and model. Cleft Palate Journal, 9, 3

Ward, H. W., Moss, R. L., & Darko, D. F. (1987). Prevalence of postburn depression following burn injury. Journal of Burn Care Rehabilitation, 8, 294-298.

Wilkes, G. H., & Wolfaardt, J. F. (1988). Report on Workshop on Tissue Integrated Implants in Craniofacial Rehabilitation, Presented September 21, 1988 at the Department of Otolarangology, Sahkgren's Hospital University of Goteborg, Sweden.

Wilkes, G. H., & Wolfaardt, J. F. (1994). Osseointegrated Alloplastic versus Autogenous Ear Reconstruction: Criteria for Treatment Selection. Plastic and Reconstructive Surgery, 93, 967-979.

Appendix A

QUESTIONNAIRE

Date ....
year month day

Name .....

Date of Birth ....
year month day

Occupation .....

Marital Status ☐ ☐ ☐ ☐ ☐
married single divorced widow/er cohabiting

Work Status ☐ ☐ ☐ ☐ ☐
student housewife working sick-listed sickness pension

Address .....
street

.....
town zip code

Home telephone No. .....

Work telephone No. .....

Please return questionnaire to:

Appendix B

Proximal Post-Operative Request Letter

Dear:

Thank you for your cooperation in our study on Craniofacial Rehabilitation. The following set of questionnaires will help us to better understand the changes that have come about as a result of the surgery. This exercise should take you about an hour. We ask that you read the instructions for each set of questions and follow the instructions carefully. The initial set of questionnaires are standardized and need to be answered properly (i.e., either yes or no, rated 1 through 7, etc.). Previous patients have indicated that this format is sometimes restrictive and that they would like to add some more information to their answers. To help satisfy this desire we have provided space at the end of this exercise for you to relate your personal experiences of this rehabilitation program.

Thank you again for your cooperation.

Sincerely

Steve Stephanson
Psychology Researcher

Appendix C

Distal Post Operative Request Letter

July 6, 1994

Patient's Name
Address
City
Postal code

Dear ,

As part of a follow-up study on your experience with Craniofacial Rehabilitation we are sending this set of questionnaires for you to complete. If you remember, you completed a similar set of questionnaires in October, 1989 at the University of Alberta campus. Your help in filling out these questionnaires is **important** for our research and the continued improvement of our rehabilitation program.

As the results of this study will be presented to the COMPRU team in early September, 1994, it is **important that you complete this task soon** after receiving it. We are hoping to get completed surveys back by July 21, 1994. It is important for consistency that you do this in one sitting. Please set aside an uninterrupted time period to complete this task (allow yourself about an hour).

Others in the program were able to come into the COMPRU unit to complete these questionnaires. For your convenience we are sending this package to you. The following is the standard set of instruction:

Thank you for your cooperation in our study on Craniofacial Rehabilitation. The following set of questionnaires will help us to better understand the changes that have come about as a result of the surgery. This exercise should take you about an hour. We ask that you read the instructions for each set of questions and follow the instructions carefully. The initial set of questionnaires are standardized and need to be answered properly (i.e., either yes or no, rated 1 through 7, etc.). Previous patients have indicated that this format is sometimes restrictive and that they would like to add some more information to their answers. To help satisfy this desire we have provided space at the end of this exercise for you to relate your personal experiences of this rehabilitation program.

Thank you again for your cooperation.

Sincerely,

Steve Stephanson
Psychology Researcher

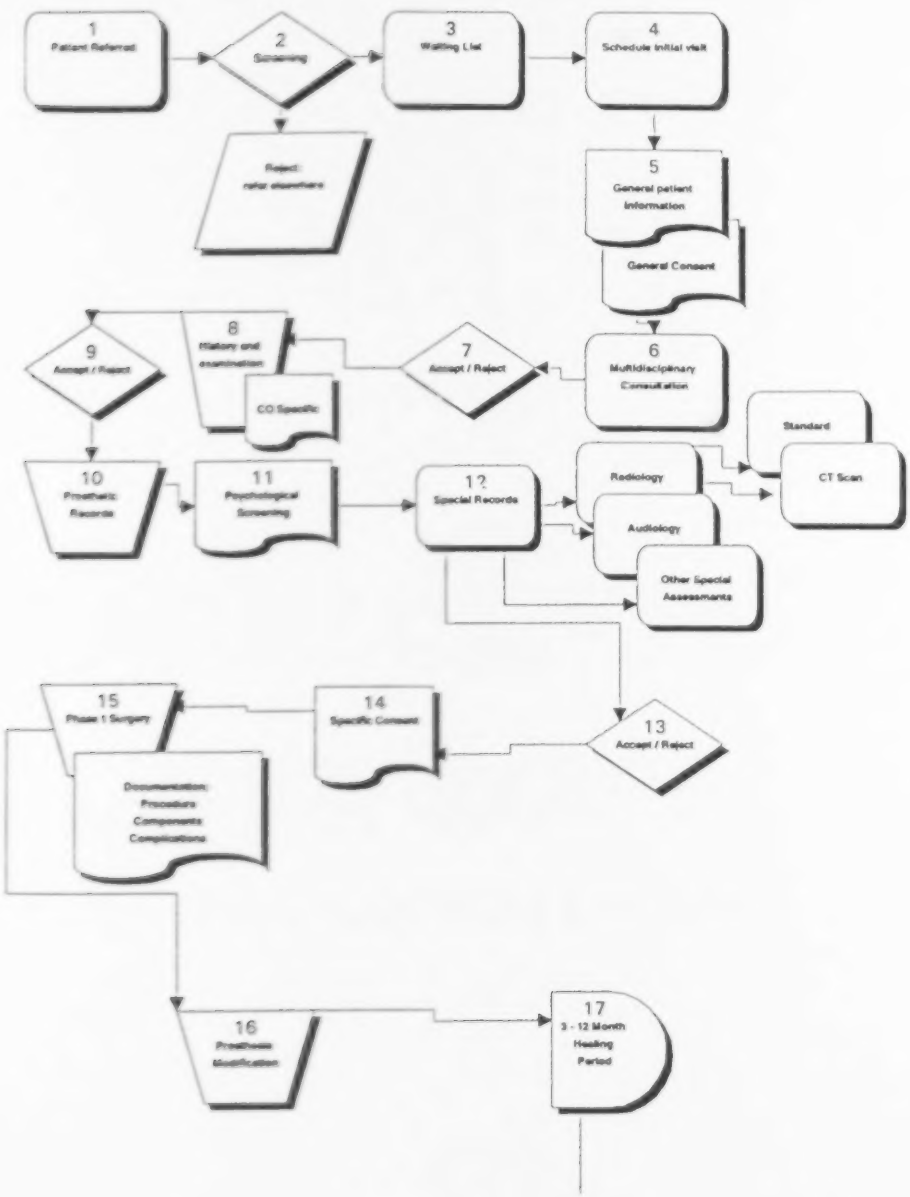
Appendix D

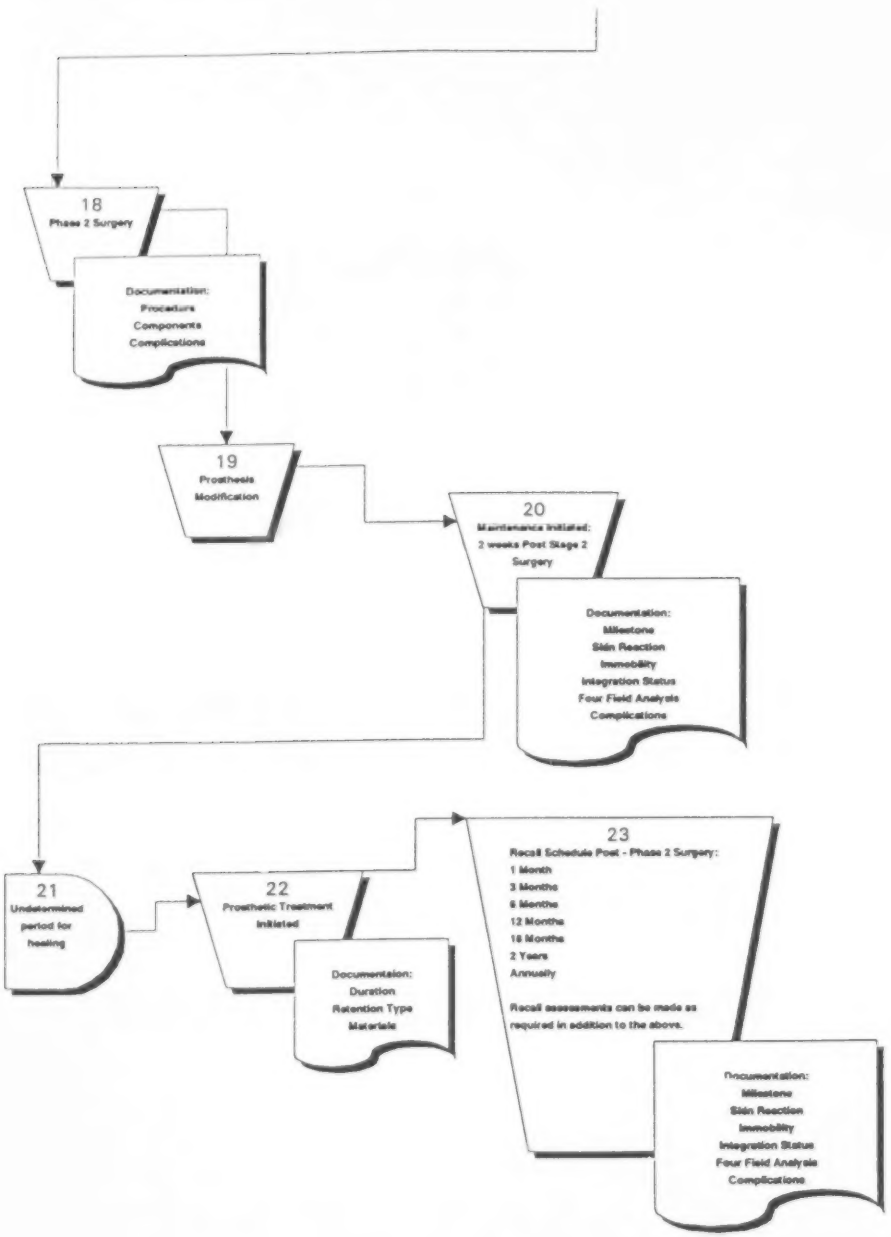
Post-Operative Open-Ended Questionnaire

Thank you again for completing the above questionnaires. On this page you may share with us any aspect of your rehabilitation that you feel you would like to share or that you felt was not covered in the above questionnaires.

Appendix E

COMPRU Screening Protocol




18
Phase 2 Surgery
Documentation:
Procedure
Components
Complications
19
Prosthesis
Modification
20
Maintenance Initiated:
2 weeks Post Stage 2
Surgery
Documentation:
Milestone
Skin Reaction
Immobility
Integration Status
Four Field Analysis
Complications
21
Undetermined
period for
healing
22
Prosthetic Treatment
Initiated
Documentation:
Duration
Retention Type
Materials
23
Recall Schedule Post - Phase 2 Surgery:
1 Month
3 Months
6 Months
12 Months
18 Months
2 Years
Annually
Recall assessments can be made as
required in addition to the above.
Documentation:
Milestone
Skin Reaction
Immobility
Integration Status
Four Field Analysis
Complications

Key to Shapes